

Enclosure 1

SUMMARY TO SUPPORT EPA'S PROPOSED ACTION

I. Introduction

The purpose of this review document is to describe the rationale for EPA's partial approval and partial disapproval of Missouri's 2002 Clean Water Act (CWA) Section 303(d) List (List). The following discusses key elements of the State's submission based on the CWA and implementing regulations. EPA's review of Missouri's list is based on EPA's analysis of whether the State reasonably considered existing and readily available water quality-related data and information and subsequently reasonably identified waterbodies which should be included on the State's List and provided good cause for removing waterbodies from the state's 303(d) list.

A. Statutory and Regulatory Background

Section 303(d)(1) of the CWA directs States to identify those waterbodies within its jurisdiction for which effluent limitations required by CWA Section 301(b)(1)(A) and (B) are not stringent enough to implement any applicable water quality standards and to establish a priority ranking for such waters, taking into account the severity of the pollution and the uses to be made of such waters. The Section 303(d) listing requirement applies to waters impaired by point and/or nonpoint sources, pursuant to EPA's long-standing interpretation of Section 303(d).

EPA regulations provide that States do not need to list water quality limited segments still requiring TMDLs where the following controls are adequate to implement applicable standards: (1) technology-based effluent limitations required by the CWA, (2) more stringent effluent limitations required by State or local authority, and (3) other pollution control requirements required by State, local, or federal authority. *See* 40 CFR 130.7(b)(1).

B. Consideration of Existing and Readily Available Water Quality-Related Data and Information

In developing Section 303(d) lists, States are required to assemble and evaluate all existing and readily available water quality-related data and information, including, at a minimum, consideration of existing and readily available data and information about the following categories of waters: (1) waterbodies identified as partially meeting or not meeting designated uses, or as threatened, in the State's most recent CWA Section 305(b) report; (2) waterbodies for which dilution calculations or predictive modeling indicate nonattainment of applicable standards; (3) waterbodies for which water quality problems have been reported by governmental agencies, members of the public, or academic institutions; and (4) waterbodies identified as impaired or threatened in any Section 319 nonpoint assessment submitted to EPA. *See* 40 CFR 130.7(b)(5). In addition to these minimum categories, States are required to consider any other data and information that is existing and readily available.

EPA's 1991 Guidance for Water Quality-Based Decisions describes categories of water quality-related data and information that may be existing and readily available. *See* Guidance for Water Quality-Based Decisions: The TMDL Process, EPA Office of Water, 1991, Appendix C ("EPA's 1991 Guidance"). While States are required to evaluate all existing and readily available water quality-related data and information, states sometimes decide to rely or not rely on particular data or information in determining whether to list particular waters.

In addition to requiring states to assemble and evaluate all existing and readily available water quality-related data and information, EPA regulations at 40 CFR 130.7(b)(6) require states to include as part of their submissions to EPA documentation to support decisions to rely or not rely on particular data and information and decisions to list or not list waters. Such documentation needs to include, at a minimum, the following information: (1) a description of the methodology used to develop the list; (2) a description of the data and information used to identify waters; and (3) any other reasonable information requested by the EPA Regional Office.

C. Priority Ranking

EPA regulations also codify and interpret the requirement in Section 303(d)(1)(A) of the CWA that states establish a priority ranking for listed waters. The regulations at 40 CFR 130.7(b)(4) require states to prioritize waters on Section 303(d) lists for TMDL development, and also to identify those water quality limited segments (WQLSs) targeted for TMDL development in the next two years. In prioritizing and targeting waters, states must, at a minimum, take into account the severity of the pollution and the uses to be made of such waters. *See* Section 303(d)(1)(A). As long as these factors are taken into account, the CWA provides that states establish priorities. States may consider other factors relevant to prioritizing waters for TMDL development, including immediate programmatic needs, vulnerability of particular waters as aquatic habitats, recreational, economic, and aesthetic importance of particular waters, degree of public interest and support, and state or national policies and priorities. *See* 57 FR 33040, 33045 (July 24, 1992), and EPA's 1991 Guidance.

II. Analysis of Missouri's 2002 Section 303(d) List

EPA has reviewed Missouri's submission and has concluded that its 2002 CWA Section 303(d) List is in partial compliance with the CWA and its implementing regulation. Missouri's list does not include all waterbodies that meet section 303(d) listing requirements. As such, the list is partially approved and partially disapproved. EPA's review is based on its analysis of whether the State reasonably considered existing and readily available water quality-related data and information and reasonably identified waterbodies to be included on its list.

EPA has reviewed Missouri's description of the data and information the State considered, its methodology for identifying waterbodies and Missouri's responses to public comment. EPA is approving the State's decision to list waterbodies and pollutants identified in Enclosure 4 of this letter, "Corrected Missouri 2002 Section 303(d) List". Enclosure 4 of this letter is EPA's reconciliation/correction of discrepancies between the 1998 EPA approved list and Missouri's August

27, 2002 submission that were unaccounted for by the State. These unaccountable differences consisted of incorrect or different waterbody identification numbers, waterbody names, descriptions of pollutant sources, and county names, plus there were some duplications. EPA's decision to approve the listings in Enclosure 4 does not mean that EPA concurs with or is taking any action with respect to Missouri's Listing Methodology. EPA considers the state methodology in the Agency's decision to approve the waterbodies and pollutants listed by Missouri. However, EPA also reviewed the data and information provided by the State, including public comments, as part of its list submittal to determine whether Missouri listed all waterbodies and pollutants not attaining water quality standards and meeting federal listing requirements. EPA concludes that the State's decision to not list several waterbodies and pollutants is not consistent with federal listing requirements. As discussed in this document, available data and/or information are sufficient to support a conclusion that these waterbodies need to be listed, or sufficient data and/or information was not provided by the State to support removing these waterbodies from the currently EPA approved List.

The purpose of the State's "Listing Methodology" is to describe the data and information considered by Missouri in identifying impaired waterbodies. According to the State's "Listing Methodology", data sources used to assess water quality conditions in Missouri and to aid in the compilation of the Missouri 305(b) report and Section 303(d) list include: (1) Water quality and sediment data collected at fixed stations and analyzed by MDNR personnel; (2) Fixed station water quality data being collected by cooperating college institutions such as Crowder College and the University of Missouri-Columbia, and State and Federal agencies such as the U.S. Geological Survey, U.S. Army Corps of Engineers, Missouri Department of Conservation (MDC), USDA/Agricultural Research Service, Missouri Department of Health and Senior Services (MDHSS), and the U.S. Environmental Protection Agency; (3) Monitoring data collected by U.S. National Park Service, U.S. Forest Service, several of the State's larger cities, and the states of Arkansas, Kansas, Iowa and Illinois; (4) Monitoring data acquired by wastewater dischargers as a condition of discharge permits issued by the State; and (5) Data collected by volunteers that have passed Quality Assurance/Quality Control tests. Data or information from these varied sources includes not only chemical and sediment data, but also fish tissue monitoring, monitoring of fish occurrence and distribution, aquatic biological data, MDC's fish kill and water pollution control investigation reports, MDHSS Fish Consumption Advisories, and special water quality surveys.

Although Missouri's Listing Methodology comprehensively identifies sources of data and information, additional existing and readily available data and information has come to the attention of EPA, including public comment material for purposes of determining whether or not the State demonstrated good cause for not including, on the list, either waterbodies or pollutants causing impairment.

A. Nonpoint Sources

The State listed waterbodies with nonpoint sources causing or expected to cause impairment, consistent with Section 303(d) and EPA guidance. Section 303(d) lists are to include all water quality limited segments (WQLSs) still needing TMDLs, regardless of whether the source of the impairment is

a point and/or nonpoint source. EPA's long-standing interpretation is that Section 303(d) applies to waters impacted by point and/or nonpoint sources. In *Pronsolino v. Marcus*, the District Court for the Northern District of California held that section 303(d) of the Clean Water Act (CWA) authorizes EPA to identify and establish total maximum daily loads (TMDLs) for waters impaired by nonpoint sources, *Pronsolino et al. V. Marcus et al.*, 91 F. Supp. 2d 1337, 1347 (N.D.Ca.2000), *aff'd*, *Pronsolino v. Nastri*, 291 F.3d 1123 (9th Cir 2002). See also EPA's 1991 Guidance and National Clarifying Guidance for 1998 Section 303(d) Lists, Aug. 27, 1997.

B. Priority Ranking in Missouri's 303(d) List

Missouri's Listing Methodology describes how the state will prioritize waterbodies for purposes of establishing TMDLs. Missouri provided a list which included a priority ranking of each waterbody as required in Section 303(d)(1)(A) of the CWA and 40 CFR 130.6(b)(4) of EPA's implementing regulations.

C. Schedule

The consent decree resulting from Civil Action No. 98-1195-CV-W and Consolidated Case No. 98-482-CV-W requires a cumulative number TMDLs for 62 waterbodies to be completed by December 31, 2003 and a cumulative number of TMDLs for 83 waterbodies to be completed by December 31, 2004.

D. Waterbody Name Change

During Missouri's development of the 2002 list, the following waterbodies were identified as listed on the 1998 list with the incorrect waterbody name. The following corrections have been made to the 2002 list and are reflected on Enclosure 4 "Corrected 2002 Missouri 303(d) List".

(1) Chat Creek (WBID 3168), is incorrectly named on the 1998 List. According to Missouri's Water Quality Standards, 10 CSR 20-7.031, the correct name is "Douger Branch". Since MDNR still submitted it as Chat Creek on their 2002 list, EPA is making this correction (i.e., change the name from Chat Creek to Douger Branch) on Enclosure 4 "Corrected 2002 Missouri 303(d) List.

(2) Salt River (WBID 103), Pike County, was incorrectly named on the 1998 List as Cannon Re-Reg Pool (WBID 103) in Ralls County. MDNR changed Cannon Re-Reg Pool to Salt River to correct this error in accordance with Table H of Missouri's Water Quality Standards, 10 CSR 20-7.031.

E. EPA Consideration of Missouri's Delistings

1. Waterbodies Inappropriately Identified As "Delisted" by Missouri

EPA determined that the waterbodies identified below were erroneously identified by Missouri

in their 2002 list submission for delisting. For a waterbody to be delisted it first has to have been on the last EPA approved 303(d) list. The first group of waterbodies (a) listed below are not on the 1998 list. Furthermore, although these waterbodies were proposed during Missouri's public comment period for inclusion on the 303(d) list in 2002 (for the first time), these waterbodies were not included on the final list that was submitted to EPA. Therefore, EPA concludes that these waterbodies were erroneously identified for delisting by the State. The second group of waterbodies listed below (b) were already on the EPA approved 1998 list and retained on the 2002 list. Some of these had undergone some change from 1998 (e.g., added or changed pollutants) while others did not. Regardless, these waterbodies were retained on the 2002 list from the 1998 list and therefore should not have been identified for delisting.

(a) Waterbodies Not Listed in 1998, not added in 2002, but erroneously identified for delisting:

<u>Waterbody Name</u>	<u>Waterbody ID</u>
1. Bear Creek	9000
2. Deepwater Creek	1215
3. Flat Creek	3593
4. Hinkson Creek	1008 (WBID 1007 listed in '98)
5. Hubble Creek	2197

(b) Waterbodies on Missouri's 2002 List that were retained from the 1998 list and erroneously identified for delisting:

<u>Waterbody Name</u>	<u>Waterbody ID</u>
1. Elkhorn	189
2. Mississippi River	1707
3. N. Fabius River	56
4. Osage River	1031
5. S. Wyaconda River	50
6. Salt River	91
7. Salt River	103
8. St. Francis River	2968
9. Troublesome Creek	73
10. Whetstone Creek	1505 (Category 3)

2. Delistings Without Good Cause

Missouri's 2002 Section 303(d) List submission package included a table of waterbodies proposed for delisting on the basis that Missouri Department of Natural Resources (MDNR) "is not aware of any data indicating that these waters are no longer impaired". Additionally, MDNR provided information in support of delisting certain waters and later provided EPA with follow-up information on several waterbodies that were included in the State's proposed delisting table. EPA is proposing to

add 46 of these delisted waterbodies back to Missouri's 2002 Section 303(d) list either because Missouri did not provide "existing and readily available data and/or information" to support delisting or because the data and/or information that was provided did not support delisting.

a. EPA is proposing to add back to Missouri's 2002 Section 303(d) list the following waterbodies based on EPA's review of information provided by the state after the list was submitted. EPA believes that the follow-up information provided by the State does not support delisting. These 6 waterbodies are included among the 46 waterbodies identified in Table 1 of Enclosure 2:

(1) **Dry Auglaize Creek, Laclede County (WBID 1145)** - MDNR's Environmental Services Program (ESP) conducted a biological assessment of Dry Auglaize Creek below the Lebanon Wastewater Treatment Facility (WWTF). The sampling was conducted on March 15, and September 25, 2000. Data was provided to the MDNR's Water Pollution Control Program (WPCP) for use in evaluating the biological integrity of a stream receiving effluent from a municipal owned wastewater treatment facility. Standardized collection and analyses methods were conducted in accordance with the State's Semi-quantitative Macroinvertebrate Stream Bioassessment Project Procedure. Sampling took place at two Stations located downstream of the Lebanon WWTF. Analyses of the data indicated that Dry Auglaize Creek had impaired macroinvertebrate communities with biological ratings in both seasons of partially sustaining for Station #1 and non-sustaining for Station #2. Dry Auglaize Creek is an effluent dominated stream and the major cause of impairment is assumed to be the WWTF, but because the landcover in the hydrologic unit where the Dry Auglaize Creek sampling stations are located has higher urban grassland percentages than elsewhere in the Ozark/Osage Ecological Drainage Unit, then in addition to the WWTP, both urban and livestock influences could also be contributing to the rating of the stations on Dry Auglaize Creek as partial or biologically non-sustaining. According to 40 CFR 130.7(b)(1), States are not required to list impaired waters still requiring TMDLs where effluent limitations required by the CWA, more stringent effluent limitations required by State or local authority, or other pollution control requirements required by State, local, or federal authority are stringent enough to implement applicable water quality standards. Although there is an existing NPDES permit which includes effluent limits from the WWTP for BOD, other unknown sources may also be causing impairment. Therefore, EPA proposes to add Dry Auglaize Creek back to Missouri's 2002 303(d) list for BOD and Unknown (see Table 1 of Enclosure 2).

(2) **Hinkson Creek (WBID 1007)** - It is EPA's understanding that the State intends to provide the results of a recently completed study of Hinkson Creek during EPA's public comment period on EPA's proposed action on Missouri's 2002 Section 303(d) list. To-date the EPA has not received any new data or information from the State to support the delisting of Hinkson Creek. Hence, EPA proposes to add back Hinkson Creek for "Unspecified" pollutant to the 2002 Missouri 303(d) list (see Table 1 of Enclosure 2).

(3) **Lake of the Ozarks (WBID 7205)** - Listed in 1998 for "Low DO, Gas Supersaturation, and Fish Trauma) based on verbal comments by Missouri Department of Conservation staff. To MDNR's knowledge, there is no organized effort by MDC or any other state or federal agency to collect and maintain data on these problems. The Department reviewed no new data during the 200

listing cycle. EPA proposes to add back the Lake of the Ozarks for the aforementioned conditions to the 2002 Missouri 303(d) list (see Table 1 of Enclosure 2).

(4) **Lake Taneycomo (WBID 7314)** - Listed in 1998 for “low DO”. There is a very large amount of data collected by the USGS showing chronic exceedences of Missouri dissolved oxygen standard for Lake Taneycomo. EPA proposes to add back Lake Taneycomo for “low DO” to the 2002 Missouri 303(d) list (see Table 1 of Enclosure 2).

(5) **Pearson Creek (WBID 2375)** - Listed in 1998 for “unknown toxicity” based on information showing trends of declining aquatic invertebrate diversity. Norman Youngsteadt, City Utilities of Springfield, studied aquatic macroinvertebrates in the James R., Pearson, Turner, Sawyer and Wilson Creeks. Pearson Creek below Jones Br. showed definite loss of aquatic macrobenthic diversity and poorer biotic indices compared to the other streams. Lower Pearson Creek also showed declines over the period 1964 to 1992, roughly corresponding to urbanization of that watershed. EPA proposes to add back Pearson Creek for “unknown toxicity” to the 2002 Missouri 303(d) list (see Table 1 of Enclosure 2).

(6) **Wilson’s Creek (WBID 2375)** - Listed in 1998 for “unknown toxicity” based on two studies. The first was study of the long term decline in aquatic macroinvertebrate populations in Wilson’s Creek by Norman Youngsteadt of City Utilities of Springfield. The second study was conducted by Del Wayne Nimmo of the National Park Service. He used aquatic toxicity testing and found toxicity in Wilson’s Creek and tributaries within the City of Springfield. EPA proposes to add back Wilson’s Creek for “unknown toxicity” to the 2002 Missouri 303(d) list (see Table 1 of Enclosure 2).

b. Missouri delisted 10 reservoirs and 3 lakes from the 2002 Section 303(d) list on the basis that long term levels of herbicides are now less than state water quality standards (atrazine 3 ug/l) or federal health advisory levels (cyanazine 1 ug/l). After review of the herbicide data, EPA proposes to add back the following two lakes to Missouri’s list (See Table 1 of Enclosure 2 - “Waterbodies EPA proposes to add back to Missouri’s 2002 Section 303(d) List”):

(1) **Cameron Lake No. 1 (WBID 7120)** - Cameron Lake No. 1 was listed as impaired by Atrazine in the 1998 303(d) list and was given a high priority for analysis. MDNR did not present any water quality data for Cameron Lake No. 1. The statement MDNR made about Cameron Lake No. 1 is, “Cameron #1 and #2 are upstream from Cameron #3. All water for the City of Cameron is drawn from #3. Lake #1 and #2 have not been monitored since 1998 but based on results from #3 are presumed to also be in compliance with water quality standards.”

There is no data to support that Cameron Lake No. 1 is meeting water quality standards.

(2) **Cameron Lake No. 2 (WBID 7121)** - Cameron Lake No. 2 was listed as impaired by Atrazine in the 1998 303(d) list and was given a high priority for analysis. In 2002, MDNR delisted Cameron Lake #2, but did not present any water quality data. The only statement MDNR made about Cameron Lake No. 2 is “Cameron No.1 and No. 2 are upstream from Cameron No. 3. All water for the City of Cameron is drawn from No. 3. Lake No. 1 and No. 2 have not been monitored since 1998 but based on results from No. 3 are presumed to also be in compliance with water quality standard.”

There is no data to support that Cameron Lake No. 2 is meeting water quality standards.

c. In addition to the 13 delisted lakes and reservoirs, Missouri also delisted an additional 13 waterbodies. Data were provided for 11 of these 13 waterbodies. Based on a review of the information provided by MDNR, EPA proposes to add the following two waterbodies back on the Missouri List (See Table 1 of Enclosure 2 - “Waterbodies EPA proposes to add back to Missouri’s 2002 Section 303(d) List”):

(1) **Little Osage River (WBID 3652), Vernon County** - The Little Osage River was added to Missouri’s 1998 303(d) list by EPA. Missouri conducted an extensive water quality study of the Little Osage River and other similar streams prior to EPA adding it to the 1998 list. MDNR concluded that the data indicated that during summer months and periods of dry weather that those streams became very low in dissolved oxygen, even in the absence of point and nonpoint pollution contributions. Missouri contended that these conditions were naturally occurring conditions and covered by the naturally occurring provision of their water quality standards at 10 CSR 20-7.031 (4)(A)3. EPA provided comment to MDNR regarding its proposed 1998 list on May 7, 1998, and stated that even though Missouri considered naturally occurring sources such as runoff from undisturbed lands to be nonpoint sources of pollution, MDNR still had to list waters impaired by nonpoint source pollution on the 303(d) list. Further, EPA stated where natural conditions such as salinity, pH, or metals exceed state-adopted water quality criteria, the state should adopt site-specific criteria or remove the aquatic life designated use if the use is not attainable due to naturally occurring conditions. The state should consider ambient concentrations or conditions that exceed the adopted criteria as violations of state water quality standards unless site specific criteria for those waters address the issue.

EPA disagreed with MDNR’s delisting of the Little Osage River in 1998, and EPA added the Little Osage River to Missouri’s 303(d) list. EPA’s rationale for adding the Little Osage River to the 1998 list was that Missouri’s use of the natural background condition can be improperly used to fail to list waters impaired by nonpoint sources. Regulations require that impairments resulting from nonpoint sources of pollution, regardless of the source, must be included on the 303(d) list. In addition, EPA learned that MDNR considered anthropogenic sources of pollution (or nonpoint source pollution) to be an element of the natural background determination. EPA’s policy regarding naturally occurring pollutants clearly states that when setting natural background concentrations, anthropogenic sources of those pollutants, including some nonpoint sources of pollution, may not be factored into the site-specific criterion. EPA has encouraged Missouri to develop a site-specific criterion based upon natural background that excludes anthropogenic sources¹.

EPA listed the Little Osage River on the 1998 list, but did not list a pollutant or condition. In 2002, MDNR delisted the Little Osage River because EPA did not specify a pollutant or condition and

¹For the current triennial review of State WQSs, MDNR has developed a preliminary draft “Site Specific Criteria Methodology” which outlines how natural conditions (or naturally occurring contaminants) will be characterized based on reference (stream, lake) conditions. EPA will review and provide comment on the methodology.

did not provide data or documentation to demonstrate that this waterbody is impaired.

Since the 1998 303(d) list, MDNR has not modified its water quality standards by developing site specific criteria for the Little Osage River to address the low dissolved oxygen condition. MDNR did not provide EPA the data contained in the “extensive” water quality studies to support its natural background conclusion or to develop a site-specific criterion for dissolved oxygen. Therefore, MDNR has not successfully demonstrated that the low dissolved oxygen condition of the Little Osage River is due to naturally occurring conditions versus anthropogenic sources. EPA proposes to add the Little Osage River back on Missouri’s list for “low DO”.

(2) **Marmaton River (WBID 1308), Vernon County** - The Marmaton River was added to Missouri’s 1998 303(d) list by EPA. Kansas provided data to MDNR that indicated ammonia levels from the Fort Scott wastewater treatment plant decay such that by the time the stream reaches the Missouri state line, the instream concentrations of ammonia meet Missouri’s water quality standards. Missouri considered the low levels of dissolved oxygen (DO) found in the Marmaton River to be of natural origin.

EPA disagreed with MDNR’s delisting of the Marmaton River in 1998, and EPA added the Marmaton River to Missouri’s 303(d) list. EPA’s rationale for adding the Marmaton River to the 1998 list was that Missouri’s use of the natural background condition can be improperly used to fail to list waters impaired by nonpoint sources. Regulations require that waterbody impairments resulting from nonpoint sources of pollution, regardless of the source, must be included on the 303(d) list. In addition, EPA learned that MDNR considered anthropogenic sources of pollution (or nonpoint source pollution) to be an element of the natural background concentration. EPA’s policy regarding naturally occurring pollutants clearly states that when setting natural background concentrations, anthropogenic sources of those pollutants may not be factored into the site-specific criterion. EPA encouraged Missouri to develop a site-specific criterion based upon natural background that excludes anthropogenic sources. EPA added the Marmaton River to the 1998 list, but did not list a pollutant or condition. In 2002, MDNR proposed to de-list the Marmaton River because EPA did not specify a pollutant or condition and did not provide data or documentation to demonstrate that these waters are impaired.

MDNR considers the low DO concentrations in the Marmaton River to be of natural origin, but has not provided any data to support this conclusion. Kansas listed the Marmaton River in 1998 for DO and has developed a Total Maximum Daily Load (TMDL) to address the low DO concentrations in the Marmaton River. The TMDL for DO was based upon monitoring data gathered in the watershed. At one monitoring station (Station 208) near the Kansas-Missouri stateline, 24% of the DO samples collected were below the criterion, which indicates that the Marmaton River has a baseline condition of non-support of the designated aquatic life use. The TMDL goes on to state, “At site 208 the average BOD, nitrate and total phosphorous concentrations for the samples were more than double that of sites 559 and 207 while average temperature, turbidity and flow were much the same. This indicates a significant nutrient load is being added to the river between site 559 and 208 and is likely the driving factor contributing to the exceedences of criteria for DO”. While MDNR states that the ammonia concentration from the Fort Scott wastewater treatment plant decay before reaching the Missouri state line, MDNR did not make any such conclusion for the low DO levels. Based on the proximity of Kansas sampling station 208 to the Missouri stateline (approximately 3 miles), EPA

believes the Marmaton River is impaired for DO.

Since the 1998 303(d) list, MDNR has not modified its water quality standards by developing site-specific criteria for the Marmaton River to address the low dissolved oxygen condition. MDNR did not provide EPA with data to support its natural background conclusion or to develop a site-specific criterion for dissolved oxygen in the Marmaton River. Therefore, MDNR has not successfully demonstrated that the low dissolved oxygen condition of the Marmaton River is due to naturally occurring conditions versus anthropogenic sources of pollution. EPA proposes to add the Marmaton River back on Missouri's list for "low DO"

3. Delistings With Good Cause

Enclosure 3 identifies 17 waterbodies which Missouri provided good cause for removing each of the waterbodies from the state's Section 303(d) list. EPA is approving removal of these waterbodies from the 2002 list.

G. EPA Consideration of Public Comments

EPA's Consideration of Public Comments addresses the following:

1. Missouri's public comment process;
2. Public comments not addressed during the state's process; and,
3. Waterbodies EPA proposes to add to Missouri's list due to public comments.

Prior to putting out its first public notice of the draft 2002 list, the State developed a Listing Methodology. In March of 2001, the draft Listing Methodology was made available to the public for a 60-day public review and comment period.

Missouri provided further public participation for the purpose of identifying water quality limited segments (WQLSs) included on the State's list by: (1) Holding seven public meetings across Missouri during August-October 2001 in order to give citizens an opportunity to discuss waters on the list, the listing process, and to provide input to the 2002 Impaired Waters List; (2) Putting out public notices of draft lists (i.e., a 60-day public notice on August 3, 2001, that was extended another 30 days, and a 30-day public notice on June 7, 2002, that was subsequently extended twice for a total of 60 days); (3) Requesting data from data collection agencies and stakeholders; and (4) holding at least two stakeholder group meetings in conjunction with the monthly Missouri Water Quality Coordination Committee meetings.

Missouri received comments regarding its final 2002 303(d) list from groups and individuals. Some comments provided opinions while others provided water quality-related data or information. Missouri chose not to provide a responsiveness summary, but rather chose to respond individually to come comments. Public comments and MDNR responses were provided to EPA with the final list. EPA reviewed the existing and readily available data and information produced during Missouri's public comment process and made the following determinations with regard to the eight waterbodies listed below:

(1) **Kit Creek**

A comment letter, dated December 4, 2001, was received by the Missouri Department of Natural Resources (MDNR) regarding an unnamed tributary to Fox Creek. The residents in the area have formed an action group, Friends of Fox Creek, and have petitioned MDNR to have the stream named Kit Creek. According to MDNR, Kit Creek is an unclassified tributary to Fox Creek that is effluent dominated due to the discharge of Victoria Gardens Trailer Park Sewage Treatment facility.

In response to the chronic problems associated with the waste water treatment facility at Victoria Gardens, a new extended air mechanical plant was installed in August of 2002 to replace the old lagoon system. At that time, the new operating permit was based on gaining stream conditions. However, it has since been determined that the receiving stream is a losing stream. Missouri's BOD and suspended solids limits for STPs discharging into losing streams facilities are more stringent than gaining streams. As a result of this finding, under the new operating permit, the facility has opted to upgrade in order to meet the state's effluent limits for solids and BOD for a losing stream. According to MDNR field office personnel in St. Louis, the facility is under a compliance schedule to put in filtration and disinfection modifications in order to meet the more stringent BOD and solids limits. Under 40 CFR 130.7(b)(1), States are not required to list water quality limited segments still requiring TMDLs where effluent limitations required by the CWA, more stringent effluent limitations required by State or local authority, or other pollution control requirements required by State, local, or federal authority are stringent enough to implement applicable water quality standards. EPA is not adding Kit Creek to the list for BOD and suspended solids.

(2) **Blue River**

To be consistent with the Kansas 303(d) list, the Sierra Club (letter dated July 8, 2002) requested that the Blue River in Jackson County be added to the 303(d) list as impaired by fecal coliform bacteria, nutrients, and chlordane. In the same comment letter a request was made to also include DO as a cause of impairment. Missouri did not address the water quality data provided in the comment.

In the Missouri water quality standards, the Blue River is divided into four segments. The designated uses for all four segments of the Blue River include livestock and wildlife watering, protection of warm water aquatic life and human health—fish consumption, and boating and canoeing. One segment (59th Street to Bannister Road) is also designated for whole body contact recreation.

Missouri listed the four segments (WBIDs 417, 418, 419 and 421) in 1998. TMDLs have been established for the pollutant Chlordane for all four segments.

Dissolved Oxygen (DO) - In the July 8, 2002, letter, the Sierra Club provided data obtained from MDNR. The DO data indicate that 5 samples out of 59 had DO concentrations below the water quality standard of 5.0 mg/L. However, EPA was unable to verify the date, location, or quality control/quality assurance information necessary to determine the quality of the data. EPA was not able to find data from MDNR that was the same as that reported to be MDNR data by the Sierra Club. After contacting MDNR, it was determined that the actual source of the data was a USGS

study.

A review was made of the water quality data provided by the USGS study, *“Effects of Wastewater and Combined Sewer Overflows on Water Quality in the Blue River Basin, Kansas City, Missouri, and Kansas, July 1998 – October 2000.”* None of the USGS data indicate exceedences of the DO criterion in the Blue River. Therefore, EPA is not adding DO as a cause of impairment.

Fecal Coliform - The EPA verified that the fecal coliform data the Sierra Club referred to also comes from the same USGS study, *“Effects of Wastewater and Combined Sewer Overflows on Water Quality in the Blue River Basin, Kansas City, Missouri, and Kansas, July 1998 – October 2000.”* A review of the water quality data provided in this study indicates high *E. coli* values. Missouri, however, uses fecal coliform as its indicator species for pathogens. While there may be a high levels of *E. coli* in the Blue River, Missouri does not have a water quality standard for *E. coli*, and EPA is not aware of any existing or readily available fecal coliform data which demonstrates that the Blue River is not meeting current Missouri water quality standards. EPA is not adding fecal coliform as a cause of impairment.

Nutrients - The USGS study provides data for nitrate, total nitrogen, and total phosphorous; however, Missouri has no water quality standards for nitrate, total nitrogen or total phosphorous. Additionally, macroinvertebrate data from Missouri Stream Team volunteer monitoring was reviewed, but is inconclusive to determine whether water quality standards are being met. EPA is not adding nutrients as a cause of impairment.

Benzo(a)Pyrene - The Sierra Club comment letter did not request that Benzo(a)Pyrene be added as a cause of impairment of the Blue River. However, while reviewing the USGS report EPA became aware of readily available data provided in the report which demonstrates exceedences of Missouri’s fish consumption criterion for the protection of human health for Benzo(a)Pyrene. Missouri’s water quality standard for Benzo(a)Pyrene is 0.049 µg/L. The exceedences of the criterion were detected in September (0.13 µg/L) and October (0.08 µg/L) of 1998 and January (0.65 µg/L) and May (0.08 µg/L) of 1999.

Based upon existing and readily available data, EPA proposes to add Benzo(a)Pyrene as a cause of impairment (See Table 3 of Enclosure 2 - “Pollutants EPA proposes to add/back to Missouri’s 2002 Section 303(d) list”).

(3) **Brush Creek**

The Sierra Club requested that Brush Creek be added to the Missouri 303(d) list for DO. According to Missouri’s water quality standards, Brush Creek currently is not a classified stream and does not have any designated use ascribed to it. As such, other than acute toxicity criteria, numeric water quality criteria do not apply to this stream. Therefore, DO data provided by the Sierra Club cannot be used to determine impairment.

The Sierra Club also requested that Brush Creek be added to the 303(d) list as impaired by Fecal Coliform because Kansas has Brush Creek listed for fecal coliform. EPA consulted with the Kansas Department of Health and Environment (10-16-02) as well as the 1998 and 2002 303(d) lists, and Kansas did not list Brush Creek for fecal coliform or any other pollutants. EPA is not adding Brush

Creek to the list for Fecal Coliform.

(4) Indian Creek (Jackson County)

In its July 8, 2002 letter, the Sierra Club requested that Indian Creek be included on the 303(d) list for PCBs, pH, and Fecal Coliform bacteria. Indian Creek is designated for livestock and wildlife watering, protection of warm water aquatic life and human health–fish consumption, whole body contact, and industrial use from its mouth to the Kansas state line.

PCBs - The Sierra Club requested that Indian Creek be listed on the 303(d) list for PCBs based on U.S. Department of Energy (DOE) facility DMR data. In accordance with 40 CFR 130.7(b)(1), States are not required to list impaired waters still requiring TMDLs where effluent limitations required by the CWA, more stringent effluent limitations required by State or local authority, or other pollution control requirements required by State, local, or federal authority are stringent enough to implement applicable water quality standards. Therefore, because there is an existing NPDES permit which includes effluent limits for PCBs, EPA is not adding Indian Creek to the list for PCBs.

pH - The Sierra Club requested that Indian Creek be listed on the 303(d) list for pH based upon DMR data. EPA obtained pH data from DMR reports for the Department of Energy (DOE) facility (August 1998 to September 2002) from MDNR to review as well as in-stream data from their WQIS database (June 1999 - December 2001).

The EPA reviewed the DMR data (November 1999 to September 2002) from MDNR by evaluating the pH values collected upstream of the DOE discharge and those collected downstream of the discharge. There were 131 pH measurements taken above the discharge, of which 93 were above the water quality standard upper limit maximum of 9.0. The percent number of upstream exceedences was nearly 71%. Whereas the number of exceedences of the upper limit of 9.0 for the downstream of the discharge was 29 or 22% of the samples taken.

EPA also considered Missouri's WQIS data for pH. Upon EPA review of the WQIS data (June of 1999 through December of 2001) provided by MDNR, no instream violations of pH were noted below the Department of Energy discharge in Indian Creek.

Based on EPA's review of DMRs, there appears to be an upstream pH problem not related to the Department of Energy outfalls that is causing a violation of water quality standards. Given the number of measurements collected and the high number of exceedences of the state's water quality standard for pH, EPA proposes to add Indian Creek to the list for pH (See Table 2 of Enclosure 2 - "Waterbodies EPA proposes to add to Missouri's 2002 Section 303(d) list").

Fecal Coliform - The Sierra Club requested that Indian Creek be included on the 303(d) list because the State of Kansas listed Indian Creek as impaired by Fecal Coliform bacteria in both 1998 and 2002. The Sierra Club did not provide any fecal coliform data, just a request to be consistent across state boundaries. Kansas is delisting Indian Creek in 2002 because a TMDL was completed for Fecal Coliform and approved by EPA on August 28, 2001.

To obtain existing and readily available data, EPA reviewed the approved TMDL for Indian Creek Kansas data from a monitoring station located on the Kansas/Missouri stateline. EPA believes the data is existing and readily available for purposes of determining compliance with

Missouri's water quality standards. Kansas used the same data to determine that the portion of Indian Creek that runs through Kansas is impaired by Fecal Coliform. The Missouri water quality standard for Fecal Coliform in whole body contact waters is 200 colonies per 100 ml when not significantly impacted by stormwater runoff. EPA reviewed the water quality data for Station 204 provided by Kansas and confirmed 16 exceedences of Missouri's numeric criterion during the recreational season of April 1 to October 31 from May of 1998 through October of 2001. Furthermore, the geometric means of the data were exceeded for years 1998, 1999, and 2001. EPA concludes that Indian Creek is not attaining its designated use for whole body contact on the Missouri side of the stateline based on the "confirmed 16 exceedences" of Missouri's Fecal Coliform standard collected at Station 204. Any reductions in coliform bacteria in Indian Creek, after crossing the stateline into Missouri, would be insignificant and therefore would not be expected to meet the Fecal Coliform standard of 200 colonies per 100 ml for Indian Creek. EPA proposes to add Indian Creek to the list for Fecal Coliform (See Table 2 of Enclosure 2 - "Waterbodies EPA proposes to add to Missouri's 2002 Section 303(d) list").

(5) James River in Greene County

In its July 8, 2002, letter, the Sierra Club requested that the James and Finley Rivers in Greene County be added to Missouri's 303(d) list due to high bacteriological counts that would impair the primary contact recreational use. The data referred by the Sierra Club was collected by the Greene County Health Department. EPA obtained the same data from the Greene County Health Department. The data collected by the health department were for *E. coli*. While there may be high levels of *E. coli* in the James and Finley Rivers, Missouri does not have a water quality standard for *E. coli*, and EPA is not aware of any existing or readily available Fecal Coliform data which demonstrates that the James and Finley Rivers are not meeting current Missouri water quality standards. Because the data collected by the Greene County Health Department are not compatible or comparable to Missouri's water quality standard, the data cannot be used to determine impairment. EPA is not adding the James River and Finley River to the Missouri list for Fecal Coliform.

(6) River Des Peres

In its July 8, 2002, letter, the Sierra Club requested that MDNR place the River Des Peres on the 2002 Missouri 303(d) list for Fecal Coliform. According to Missouri's water quality standards, the River Des Peres is designated for livestock and wildlife watering and for the protection of warm water aquatic life and human health for fish consumption.

The River Des Peres is not designated for whole body contact; therefore, the Fecal Coliform criterion does not apply to this stream. EPA cannot apply a water quality criterion to a waterbody that is not designated for that use. EPA is not adding the River Des Peres to the 2002 Missouri 303(d) list for Fecal Coliform.

During EPA's review of the Sierra Club's comments, EPA became aware of the existence of readily available data for the River Des Peres from the USGS. EPA obtained the data from the USGS. Upon review of that data, EPA observed no exceedences of the DO criterion in 1998, two exceedences in 1999 (June 17 [4.8 mg/L], August 3 [3.7 mg/L], two exceedences in 2000 (June 15 [3.7 mg/L], August 1 [4.5 mg/L] no exceedences in 2001, and one exceedence in 2002 [4.2 mg/L].

From 1998 through 2002, five exceedences out of 20 samples were noted. This number of exceedences is above the 10% allowable per Missouri's 303(d) Listing Methodology. Based on existing and readily available data and information, EPA proposes to add the River Des Peres to the 2002 Missouri 303(d) list as impaired by low DO. The likely sources are urban nonpoint sources (See Table 2 of Enclosure 2 - "Waterbodies EPA proposes to add to Missouri's 2002 Section 303(d) list").

(7) Sewer Branch (Pearl River) in Pettis County

In it's July 8, 2002, letter, the Sierra Club requested that Sewer Branch be added to the 303(d) list as impaired by DO and excessive nutrients.

MDNR conducted a visual /qualitative benthic (V/B) survey in 2000 in the vicinity of the Hubbard Park combined sewer overflow (CSO) point. The CSO is located upstream of the Sedalia North Wastewater Treatment Plant and downstream of an industrial park area. No aquatic macroinvertebrates were found either upstream or downstream of the CSO point. MDNR also indicated that the appearance of the water and stream sediment was poor. The portion of Sewer Branch downstream of the Sedalia North wastewater treatment plant was the subject of three 24-hour intensive water quality surveys by Missouri DNR between 2000 and 2002. The narrative summary of the V/B survey presented data collected during these surveys indicating the waterbody is partially impaired due to degraded aquatic habitat. Data provided by MDNR indicated that of the twenty samples collected above and below the Sedalia wastewater treatment plant located on Sewer Branch five of these samples collected above the wastewater treatment plant were in violation of Missouri's DO water quality standard of 5 mg/L.

Because macroinvertebrates were found to be lacking upstream of the CSO, which is an indication that the aquatic life use designation of Sewer Branch is not being met, and because the waterbody above the wastewater treatment plant is not in compliance with Missouri's water quality standard for DO, EPA proposes to add Sewer Branch to Missouri's list for DO and unknown pollutants (See Table 2 of Enclosure 2 - "Waterbodies EPA proposes to add to Missouri's 2002 Section 303(d) list").

(8) Dardenne Creek, St. Charles County, Missouri (WBID 221)

Dardenne Creek was not on Missouri's submission to the 303(d) list. MDNR's response to public comments, dated October 2, 2001 and October 19, 2001 stated that MDNR was proposing to place Dardenne Creek on the 2002 303(d) list based on data that indicated the presence of an impaired aquatic invertebrate community. MDNR generated an Excel file containing the results of biological samples which were collected in the Spring of 2000. There were five stations on Dardenne Creek where samples were collected in accordance with MDNR's Semi-qualitative Stream Macroinvertebrate Bioassessment Project Procedure. Numeric Biological Criteria utilizes 4 primary metrics (Total Taxa, EPT Taxa, Biotic Index, and the Shannon Diversity Index). Each of the four primary metrics for Numeric Biological Criteria was calculated for reference streams within the same ecological region and the study stream. Scoring against each of the reference stream metrics assesses the study stream. Scores between 20-16 are fully biologically supporting, between 14-10 are partially

biologically supporting, and between 8-4 are non-biologically supporting. Scores for the Dardenne Creek study stations were as follows:

Station # 1 = 8 (downstream of Hwy 40/61 at Hwy 70 in St. Peters)

Station # 2 = 6 (At Hwy 40/61 in Bush Wildlife Area)

Station # 5 = 12 (downstream of Hwy 40/61 at Hwy N in Cottleville halfway between site 1 & 2)

Station # 3 = 16 (Upstream of Bush Wildlife Area at Hopewell Rd. in St. Charles County)

Station # 4 = 10 (Upstream of Bush Wildlife Area at Holt Rd. in St. Charles County in a channelized reach in a suburban area that is developing at an accelerated rate)

Stations #1, #2 and #5 were found to be either partially or non-biologically sustaining. This section of stream has many urban influences as well as past channelization.

A memo containing the results and conclusion of MDNR's macroinvertebrate study of Dardenne Creek was transmitted to Ms. Caitlyn Peel, Assistant Director of Government Affairs, Home Builders Association of Greater St. Louis on July 2, 2002, from Randy Sarver, Water Quality Monitoring section/MDNR. Also, in a letter, dated July 11, 2002, from John Ford, MDNR, to Ms. Peel, Mr. Ford commented that the aquatic invertebrate community sampling conducted by the DNR in the last 2-3 years is considered "high quality data since it is a direct measure of the sum total of all stressors (on) aquatic life".

Based on the results and conclusions of MDNR's macroinvertebrate study of Dardenne Creek, EPA proposes to add Dardenne Creek to Missouri's list for unknown pollutant due to Urban/Rural NPS (See Table 2 of Enclosure 2 - "Waterbodies EPA proposes to add to Missouri's 2002 Section 303(d) list").

H. EPA Consideration of Pollutant Name Changes and/or Deletions by Missouri

1. Algae to Nutrients

Four (4) waterbodies which were listed in 1998 as being impaired by "Algae" were changed to "Nutrients". MDNR had originally listed algae as the pollutant in 1998 because the concern was taste and odor problems periodically experienced in finished drinking water. High algal populations in lakes tend to correlate closely with taste and odor problems. Missouri reasoned, however, that changing the pollutant name for these four waterbodies from "Algae" to "Nutrients" in the 2002 list was a more logical and practical way to measure pollutant loads into lakes.

Variables for determining the trophic state in lakes can be classified as either stressor or response. Recent EPA guidance on nutrient variable selection suggests total nitrogen or total phosphorous as appropriate measures of nutrient stressors. Chlorophyll *a* and turbidity have been suggested by the guidance as appropriate response variables. Therefore, it is EPA's conclusion that the pollutant name change from "Algae" to "Nutrients" is technically valid provided that "nutrients" are defined as nitrogen and phosphorous variables. This change is consistent with current EPA guidance and is scientifically defensible. Thus, EPA is approving the pollutant name changes for the following

waterbodies:

<u>Waterbody Name</u>	<u>Waterbody ID</u>	<u>Pollutant</u>
Fellows Lake	WBID 7237	Nutrient
Lamar Lake	WBID 7356	Nutrient
McDaniel Lake	WBID 7236	Nutrient
Spring Fork Lake	WBID 7187	Nutrient

2. “NFR or Sediment” to “VSS or NVSS”:

Twenty-two (22) waterbodies were listed in 1998 as being impaired by “NFR” (i.e., non-filterable-residue) or “Sediment”. For the 2002 list MDNR converted the pollutant description “NFR” or “Sediment” impaired waters from the 1998 list to either “VSS” or “NVSS” (Volatile Suspended Solids or Non-Volatile Suspended Solids) because, according to MDNR, the term “sediment” or “NFR” is too broad and the pollutant name should make a clear distinction between organic and inorganic solids. EPA believes that converting the 1998 pollutant listing from “NFR” or “Sediment” to either “VSS” or “NVSS” could exclude a contributing fraction of either the organic or the inorganic components (VSS and NVSS) of sediment or NFR. For example, measuring only the organic fraction of effluent discharged from a NPDES permitted facility excludes the possible contribution of the unmeasured inorganic fraction to impairment of a receiving waterbody. Consequently, although the organic fraction in this example may be meeting the weekly or monthly NFR limit established by Missouri’s NPDES effluent regulation, the inorganic fraction, if measured and added in, could trigger an exceedence of the NFR limit. By selectively quantifying only “VSS” or “NVSS”, the effect would be to raise the limit for NFR.

Since organic and inorganic fractions are both automatically generated during analysis of “sediment” or “NFR” (with no added field or laboratory cost incurred), ascertaining both fractions is useful for identifying sources such as WWTP (typically determined from the organic fraction-VSS) and agricultural runoff (typically determined from the inorganic fraction-NVSS) in assessing the cause of impairment. In conclusion, based on EPA’s disapproval of this pollutant name change and the fact that MDNR had not provided any data that supported a discrete pollutant name change from “NFR or Sediment” to “NVSS or VSS”, EPA proposes to add the applicable pollutant (i.e., the original 1998 list designation) back to each of those 22 waterbodies which are identified in Table 3 of Enclosure 2 - “Pollutants EPA proposes to add and/or add back to Missouri’s 2002 Section 303(d) list”.

3. “Sediment” to “Habitat Loss”

The approved 1998 Section 303(d) List contains approximately 50 waterbodies which were listed as impaired by sediment. The basis for listing many of these waterbodies in 1998 as impaired by sediment centered on an examination by MDNR staff of 1980's fish distribution data from Dr. William Pflieger’s book, *Fishes of Missouri*, which indicates systematic declines in the diversity of fish communities throughout Missouri, particularly in the prairie regions of the state. Based upon Dr.

Pflieger's experience and opinion that sediment and turbidity are the major causes of fish diversity declines, MDNR listed most prairie streams as impaired by sediment for 305(b) purposes.

While developing TMDLs, MDNR postulated that other environmental factors, such as channelization, de-stabilization of stream banks, loss of permanent vegetation from the riparian zone, loss of channel heterogeneity, and in-stream woody debris, as well as changes in watershed hydrology, may also be contributing to reduced fish community diversity and therefore did not want to establish a TMDL that would disregard those other factors. The Department did not consider it appropriate to identify a specific pollutant, like sediment, when the cumulative impact of many of these conditions, including sedimentation, may be causing the impairment. Therefore, for the 2002 listing cycle, MDNR decided to convert the pollutant for many of those waters from "sediment" to "habitat loss" in a bid to account for or include other factors, in addition to sediment, causing declining fish communities.

It is also noted that in the minutes of the August 7, 2002, Missouri Clean Water Commission Meeting, MDNR staff stated:

"Many of waters in Missouri have in part been reported as impaired by sediment. Much of the justification for impairment of these waters came from historical studies of fish distribution in the state that showed many fish species were either extirpated from entire watersheds where they had previously lived, or lives in fewer locations within the watershed than previously. Conversations with fish biologists responsible for these studies, Dr. William Pflieger, suggested that the increased sedimentation and turbidity of the water were believed to be major causes of these declines."

"Many of these streams were previously listed for sediment. Use of the term sediment was in part correct. However, after the 1998 listing cycle, DNR began writing the first few TMDL documents for EPA review and staff realized the importance of making as accurate and complete a description of the problem as possible. Factors other than sediment, such as channelization, destabilization of stream banks, loss of permanent vegetation from the riparian zone, loss of channel heterogeneity and in-stream woody debris as well as changes in watershed hydrology, also played a role in declining fish communities. Consequently, the department changed the listing to a term inclusive of all these concerns, habitat loss. While evidence supports the listing of these streams due to loss of habitat, the department does not consider it appropriate to identify a specific pollutant when the cumulative impact of many of these conditions are believed to be causing the impairment, as staff believes is the situation in these streams."

In developing their 2002 303(d) List Missouri initially divided their list into the following four categories:

Category 1: waters for which numeric water quality criteria for one or more discrete pollutants cause the water to be treated as "partial attainment" or "non-attainment"; observed water quality conditions are judged to exceed state narrative water quality criteria;

Category 2: waters for which no specific discrete pollutant is listed as the cause of impairment;

Category 3: waters for which a TMDL has been established and approved by USEPA but the water quality impairment has not yet been corrected; and,

Category 4: waters which are expected to be returned to compliance with state water quality standards prior to the issuance of the next 303(d) list.

On August 7, 2002, the Missouri Clean Water Commission decided to submit only categories 1 and 3 to EPA as the Missouri 2002 303(d) List. Thus waterbodies identified in category 2, including waterbodies impaired due to habitat loss became “delisted”. This “delisting” was not necessarily the result of additional information demonstrating the lack of impairment, rather the result of placement in a category which the Missouri Clean Water Commission chose not to include on the final 2002 303(d) list submitted to EPA.

No data or documentation was provided to demonstrate that sediment is not causing the impairment for these specifically-listed streams, nor does Missouri identify that these waterbodies are no longer impaired by sediment. EPA disapproves the name change and proposes to add “sediment” back to 38 waterbodies. Of these 38 waterbodies, EPA proposes to add 34 of these waterbodies back to Missouri’s 2002 list (see Table 1 of Enclosure 2 - “Waterbodies EPA proposes to add back to Missouri’s 2002 303(d) list”). Although EPA proposes to restore sediment to the 4 remaining waterbodies, those waterbodies do not need to be “added back” to the list because they were retained on Missouri’s 2002 list as impaired by pollutants other than sediment. Those four waterbodies are the N. Fabius River, S. Wyaconda River, Troublesome Creek and Elkhorn Creek (see Table 3 of Enclosure 2).

I. Pollutants Removed by Missouri

Specific pollutants were removed from E. Brush Creek, Gabriel Creek, Mound Branch, and Stinson Creek without sufficient documentation or rationale. Missouri did not provide any existing and readily available information and/or data to support such removal. Accordingly, EPA proposes to disapprove the removal of these pollutants and add them back to Missouri’s 2002 303(d) List. These four waterbodies and the specific pollutants being restored are included on Table 3 of Enclosure 2 - “Pollutants EPA proposes to add and/or add back to Missouri’s 2002 Section 303(d) list”.

III. Consent Decree Commitments

On February 27, 2001, a consent decree became effective which settled 98-1195-CV-W and consolidated case 98-482-CV-C-5, *American Canoe Association, et.al., v. USEPA, et al.* . Terms of this agreement provided that EPA would transmit to Missouri a list of previously identified waterbodies and pollutants, referred to as the Attachment B - 26 waterbodies and pollutants, and data and information related to the Mississippi and Missouri Rivers from “boundary states”. The following

sections cover these commitments and provide EPA's rationale for approving or disapproving the State's decisions regarding these waters.

A. The 26 Waterbodies (Attachment B Waters)

As a term of the consent decree, EPA agreed to review Missouri's 2002 List to determine whether or not the 26 waterbodies and pollutants (Attachment B Waters) are included on the 2002 List. If these waterbodies are not included, EPA agreed to determine, according to 40 CFR Section 130.7(b), whether these waterbodies and pollutants need to be included on the final EPA approved List. If EPA's decision is that some or all of these waterbodies have been omitted by Missouri and should be included, EPA will disapprove the omission of specifically named waterbodies and propose for public notice and comment an amendment that includes the waterbodies and pollutants.

EPA and MDNR entered into a Memorandum of Understanding (MOU) regarding commitments relative to the determination of impaired waters and the development of total maximum daily loads. In this MOU, MDNR agreed to monitor (i.e., obtain reliable data) for the twenty-six waterbodies. EPA expected that MDNR would use the monitoring data to provide a waterbody-specific rationale justifying the omission, as appropriate, of any of these waterbodies from the 2002 List. Further, as part of the Agency decision regarding Missouri's 2002 303(d) List, EPA also committed to provide a waterbody-specific rationale justifying the omission of any of the 26 waterbodies.

MDNR first provided EPA with a monitoring report for these 26 waterbodies on March 22, 2002 and final revised report on September 4, 2002, in response to EPA's request for more information. The format of this report provides the waterbody name, waterbody identification number, classification status, sources/potential sources, sampling locations & type of sampling, impairment status & 303(d) status and discussion of results. In this report MDNR identifies 19 of the 26 waterbodies as partially impaired due to degraded habitat, 5 as attaining uses, 1 not rated and 1 as impaired. Of the 20 waterbodies identified as either impaired or partially impaired, none are included on the Missouri 2002 List.

There are several discrepancies between the list of 26 waterbodies included with the Consent Decree and the waterbodies included in Missouri's Monitoring Report. Missouri provided explanations (in bold) as follows:

- (1) **Indian Creek:** Actually Indian Creek is in Washington County
- (2) **Little Blue in Jackson County:** No Little Blue was monitored, however, four segments of the Blue River are included on both Missouri's 1998 and 2002 lists. Sierra Club advised they had confused Little Blue River with Blue River and that the concerns they had were actually on the Blue River. By mutual consent, monitoring on the Little Blue River was not included.
- (3) **Hess-Heath in Pettis-Cooper Counties:** Hess-Heath was monitored in Cooper County.
- (4) **West Locust Creek in Putnam County:** West Locust Creek was monitored in Linn and Sullivan Counties.
- (5) **Little Locust Creek in Putnam County:** Locust Creek was monitored in Putnam and

Sullivan Counties. The largest two streams in Putnam County with the word “Locust” in their names are Locust and West Locust Creeks. Missouri believes these are the two streams intended for monitoring.

(6) **East Fork Long Branch in Sullivan-Linn:** Long Branch Creek was monitored in Linn County. There is no East Fork Branch in Linn-Sullivan Counties. The name of the stream is simply Long Branch.

(7) **McCarty Creek in Vernon-Barton:** McCarty Creek was monitored in Vernon County.

(8) **Blackbird Creek in Putnam County:** The addition of Blackbird Creek on the twenty-six waterbody monitoring report was apparently due to a misunderstanding. Nevertheless, EPA reviewed the data and/or information contained in the monitoring report on Blackbird Creek and is not adding Blackbird Creek to Missouri’s list based on the findings contained in the report.

After receiving Missouri’s monitoring report of the 26 waterbodies, EPA reviewed Missouri’s 2002 Listing Methodology. This methodology describes how water quality data is evaluated for purposes of determining whether or not waters are impaired and should be included on the 303(d) List. This methodology, which Missouri issued for public comment, states that if overall use protection, aquatic life, fish consumption, drinking water supply, whole body contact, recreation or irrigation, livestock and wildlife water “shows either “partial attainment” or non-attainment of state water quality standards or an evaluation of a stream indicates noncompliance with state narrative water quality criteria”, then such waterbodies will be added to the 303(d) List. According to Missouri’s 2002 Listing Methodology, when it is evident from biological data for a waterbody designated for the Protection of Aquatic Life that the “diversity or number of intolerant taxa (are) slightly to moderately less than reference streams”, then “Partial” compliance with Water Quality Standards is indicated. “Non-attainment” bespeaks conditions where the “diversity or number of intolerant taxa (are) much less than reference streams”. Additionally, the methodology states that other types of information including observation and evaluation of waters for noncompliance with state narrative water quality criteria can be used for determining waterbody impairment. When developing the Agency’s waterbody-specific rationale justifying the omission of any of the 26 waterbodies, EPA considered Missouri’s own Listing Methodology, the 26 waterbodies monitoring report, and any other clarifying information which MDNR was able to provide.

One source of information which MDNR provided were copies of Visual/Benthic Survey field sheets for 13 of the 26 waterbodies. There was sufficient biological information in 8 of these survey forms for EPA to determine a Community Tolerance Index (CTI) value for those select streams based on the average of the tolerance values of the taxa reported on the Visual/Benthic Survey forms. The CTI is a way of relating water quality and the macro-invertebrate community. The basic premise is that taxa are assigned a numeric value from 1 to 10. A value of 1 means the taxa will not tolerate pollution while a value of 10 indicates the taxa is very tolerant of pollution. A CTI does not necessarily identify or indicate the pollutant of concern. The CTI was determined by summing the values of the taxa reported on Missouri’s Visual/Benthic survey form and finding the average value. Taxa which were recorded but not listed on or correlated with the “key sheet” of taxa and corresponding pollution tolerance values were not included in order to be consistent with the standardized approach for calculating CTI. In order to provide a standardize methodology for evaluating the status (i.e.,

Community Tolerance Index score) of those 8 waterbodies, based on biological information, the following items were considered:

- (a) The reported presence the darters (Etheostoma) and or Madtom (Noturus) was considered to indicate that the location was not impaired;
- (b) The reported presence of Chironimds (Blood worms), code number 2 on the Visual/Benthic survey form was considered to indicate the location was impaired, unless there was reported presence of a taxa which strongly supported non-impairment. In this case a value called a "Community Tolerance Index" was calculated;
- (c) Community Tolerance Index is defined as the average of the tolerance values of the taxa reported on the Visual/benthic survey form. Only taxa which were listed on the Visual/Benthic "key sheet" were utilized;
- (d) Tolerance values utilized were obtained from one or more of the sources:

Sarver, Randy & Sam McCord. 2001. Taxonomic Levels for Macroinvertebrate Identification. SOP MDNR-WQMS-209. Missouri Department of Natural Resources, Jefferson City, Missouri. 32 pp

Huggins, D. G. & M. F. Moffett. 1988. Proposed Biotic and Habitat Indices for the use in Kansas streams. Report No. 35 of the Kansas Biological Survey, Lawrence, Kansas. 128 pp.

Hilsenhoff, W. L. 1987. An improved biotic index of organic stream pollution. Great Lakes Entomologist. 20(1):31-39.

Ferrington, Leonard C. 2002. Personal communication of the appropriateness of proposed tolerance values.

- (e) Tolerance values listed in the above referenced documents were "rounded" if expressed as a decimal. For example the MDNR-WQMS-209 (Appendix A) assigns a value of 5.4 to Stenelmis. For purposes of determining the Community Tolerance Index, Stenelmis was assigned a value of 5.
- (f) In the two instances on the Visual/Benthic Survey Form "key sheet" (10. Baetid/Siphinourid Mayflies and 23. Corydalus/Chauloides) in which two taxa were combined the tolerance value was determined to be the average of the two taxa. The average value was not rounded.
- (g) Tolerance values utilized are as follows:

Oligocheates (sludge worms) 10
 Other Chironimids 7
 Goniobasis no value
 Fingernail Clams 6
 Heptagenid Mayflies 5
 Hydropsychid Caddisflies 4
Heliopsyche 3

Chironimids (Blood worms) 9
 Physa 8
 Other Gastropods 7
 Unionid Clams 5
 Baetid/Siphinourid mayflies 5.5
Chimara 4
 Other Caddisflies 5

Leeches	8	<u>Stenelmis</u>	5
<u>Psephenus</u>	4	<u>Borosus</u>	7
<u>Agabus</u>	8	Other Beetles	8
Giant Waterbug	8	Other Hemiptera	8
<u>Corydalus/Chauioides</u>	6	<u>Sialis</u>	5
Simuliids (Black flies)	6	Crayfish	8
Isopods	8	Amphipods	6

(h) A waterbody was considered to be impaired if the Community Tolerance Value was greater than or equal to 6.5.

When specific data, particularly chemical data relevant to an applicable Missouri Water Quality Standard, were made available to EPA, that data was considered and EPA's rationale regarding impairment is based on that data, as well as whether or not MDNR identified the waterbody as partially or totally impaired. There appeared to be several waterbodies for which the discussion in Missouri's monitoring report seems somewhat "disconnected" or perhaps non-conclusive. In such cases, as stated above, EPA reviewed the data and/or information provided by MDNR. In some instances, however, EPA did not have enough data and/or information to determine whether a waterbody should be included on Missouri's list.

1. Waterbodies proposed to be added

Of the 26 waterbodies, EPA proposes to add the following waterbodies to Missouri's list. These waterbodies are included on Table 2 of Enclosure 2 "Waterbodies EPA proposes to add to Missouri's 2002 Section 303(d) list :

(1) Bear Creek - Adair County

No WBID, unclassified.

Applicable WQS: General Criteria

Fish data collected by Dr. Matt Winston, Fish Ecologist, with the Missouri Department of Conservation, indicates that Bear Creek's aquatic community is adversely impacted below the Kirksville Sewage Treatment Plant (STP). Fish sampling Site Number 2, located 0.2 miles downstream of the STP, yielded only one species of fish, i.e., green sunfish, whereas 9 species of fish were collected from Site 1, located 1.5 miles upstream from the STP. The distance or length of actual biological community impacts cannot be precisely determined from the data provided, but is indicated nonetheless for some distance downstream of the STP. Fish community is relatively well established at 9.5 miles downstream of the STP at Site Number 3.

The decrease in the number of species immediately below the STP indicates some type of toxic condition or chemical change that severely limits the diversity of fish species that otherwise are found upstream of the STP. The Kirksville STP has a technology based permit with secondary treatment.

Although weekly monitoring of Ammonia is a requirement of the permit, the plant is not required to treat for Ammonia. According to EPA's file on this major NPDES facility, an end-of-pipe Ammonia concentration of 18.6 mg/l was measured once in 1990. Most other values on record were in the range of 6 to 10 mg/l. EPA's file does not contain or address a waste load allocation that would demonstrate a compliance schedule for attaining water quality standards. The biological data indicates a violation of Missouri's general water quality criteria for this unclassified waterbody. Therefore, EPA proposes to add Bear Creek to the Missouri's list for Unknown pollutants.

(2) East Fork Locust Creek - Sullivan County

WBID 608, Class P.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering.

Applicable Standards: Ammonia, DO, General Criteria

The narrative summary contained in MDNR's revised "Monitoring Report on the 26 Waters," which was based on MDNR's V/B low flow survey, conducted on 07-17-2000, indicates that the "Stream is marginally out of compliance with state narrative water quality standards for color and suspended materials" The Narrative summary indicates that site 2 has extensive benthic algae, and water is green with minor foam. Using biological information contained in the Visual/Benthic Survey forms provided by MDNR, EPA derived CTI values at the four survey sites of 6.8, 6.8, 7.7, and 5.8, respectively which indicates partial impairment. Once more, dissolved oxygen levels measured along E. Fork Locust Creek during 2000 and 2001 were slightly below the State's numeric standard in 4 out of 32 samples collected during that period.

Given the color and suspended solids violations of the general criteria [10 CSR20-7.031(3)(A)] and the violations of the numeric criterion for dissolved oxygen, it appears that the East Fork of Locust Creek is not in compliance with Missouri's water quality standards. MDNR identified this waterbody as partially impaired. EPA proposes to add East Fork Locust Creek for DO and Unknown pollutants.

(3) East Honey Creek - Mercer County

Downstream 8 mile segment is WBID 555, Class C.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering.

Applicable Standards: Ammonia, DO, General Criteria

MDNR conducted a V & B Low Flow Stream Survey on 08-03-2000 for E Honey Creek @ Hwy JJ. Eight aquatic invertebrate were found, including heptageniid mayflies, hydropsychid caddisflies, riffle beetles, and bryozoans. Shiners, creek chubs, and darters were also found in the stream. There was minor growth of epilithic, filamentous algae, and the water was slightly turbid which suggests a violation of Missouri's General Criteria in 10 CSR 20-7.031(3)(A). Slightly elevated conductivity levels and minor algal growth suggests that there are nutrients entering the stream. MDNR has identified this waterbody to be partially impaired. EPA proposes to add East Honey Creek for

Unknown pollutants.

(4) **Heath's-Hess Creek** -Pettis County

Downstream 17 mile segment is WBID 848, Class p.

The next upstream 10 mile segment is WBID 849, Class C. Some or all of WBID 849 may be shown on maps as Hess Creek.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering.

Applicable Standards: Ammonia, DO, General Criteria

No V/B STREAM SURVEY form was available. The narrative summary presented in MDNR's revised "Monitoring Report on 26 Waters," indicates that the fish, benthic invertebrate communities, and benthic algae at Sites 1 and 2 are indicative of a stream meeting its aquatic life uses. Seven types of aquatic invertebrates were noted at site 1, including crawfish, limpets, bryozoans, and abundant heptageniid mayflies. Minnows, darters and immature sunfish were also found. No algae was evident at the site and no associated aesthetic problems were noted. At site 2, nine types of aquatic invertebrates were noted, including heptageniid mayflies, hydropsychid caddisflies, and dobsonflies. Minnows, darters, madtoms and sunfish were also found. Water was clear and odorless. Epilithic, prostrate algae covered approximately 25% of the substrate. While the biological community at sites 1 and 2 appeared to be relatively healthy, the high algal density (i.e., thin, epilithic, prostrate algae covered approximately 75% of the substrate) and presence of manganese stained rock at site 3 indicates a low dissolved oxygen condition raising the question of compliance with Missouri's water quality standards. MDNR has identified this waterbody to be partially impaired. Based on conditions found at Site 3, EPA proposes to add Heath's-Hess Creek for Unknown pollutants.

(5) **Hickory Creek** - Daviess County

Downstream 1 mile segment is WBID 442, Class C. Remainder of creek is unclassified.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering.

Applicable Standards: Ammonia, DO, General Criteria

MDNR's Visual/Benthic (V/B) Low Flow Survey data collected in 2000 and the summary presented in the narrative discussion in MDNR's revised "Monitoring Report on 26 Waters," indicate that Hickory Creek is adversely impacted at Site 1. The presence of dense to relatively dense growths of filamentous algae and the presence of duckweed at Site 1 support nutrient enrichment as the cause of the adverse impact. The presence of the bottom deposits of filamentous algae appear to violate Missouri's general criteria at 10 CSR20-7.031(A). The general criteria state, "Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses." The notation of "some rocks darkened by manganese" may indicate that a diurnal oxygen sag is also occurring.

Given MDNR's documentation for Hickory Creek, it appears that the stream is not in compliance with Missouri's general water quality criteria at 10 CSR20-7.031(D) and (G). The stream appears influenced by nutrients and low dissolved oxygen that are adversely impacting the stream's

aquatic life use. Missouri identified this waterbody as partially impaired. EPA proposes to add Hickory Creek for Unknown pollutants.

(6) Hickory Creek - Grundy County

Downstream 7 mile segment is named Hickory Creek, WBID 588, Class C.

The next 1 mile upstream stream is WBID 589, Names Tributary to Hickory Creek, Class C.

Remainder of stream is unclassified.

Applicable Standards: Ammonia, DO, General Criteria

The V/B Low Flow Survey Form was not provided to EPA although there is a short discussion in the Monitoring Report about the results of a V/B Survey that was conducted by Water Pollution Control Program (WPCP) staff at Hwy W in the Spring of 2000 of Hickory Creek. The information provided by MDNR stated, "During the survey the amount of benthic algae was noted as being greater than two other nearby streams observed on this date but no other observable problems were noted." The excessive bottom deposit of benthic algae is indicative of a violation of Missouri's general criteria for bottom deposits in 10 CSR 20-7.031(3)(A).

MDNR has identified this waterbody to be partially impaired. EPA proposes to add Hickory Creek for Unknown pollutants.

(7) Indian Creek - Washington County

WBID 1946, Class P.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering.

Applicable Standards: General Criteria

The water chemistry data collected by MDNR, in 2001-2002, and provided to EPA, showed one of five samples (20%) for dissolved Zinc collected on Indian Creek @ old Hwy C, 2 miles below the Viburnum mine tailings, had a concentration of 866 (units not given but presumed to be µg/l) which is twice the State's WQS numeric chronic criteria for General Warm Water Fisheries (GWFF) at a hardness greater than 200. Aquatic macroinvertebrate community sampling at this location of Indian Creek, was conducted by DNR Laboratory Field Services Section in 2001, but the data have not yet been analyzed.

According to Missouri's listing methodology, when more than 10% of all samples collected from a waterbody exceed the chronic aquatic life criterion in the State Water Quality Standards, then the waterbody is deemed impaired. Based on the chemical data, Indian Creek would not be meeting the chronic aquatic life criterion for zinc. MDNR identified this waterbody as fully meeting water quality standards, however as described above, data indicates non-compliance with state water quality standards. EPA proposes to add Indian Creek for Zinc.

(8) Long Branch - Pettis and Johnson Counties

WBID 857, Class C. Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering.

Applicable Standards: All applicable state numeric for limited warm water streams, General Criteria

MDNR's narrative summary of the V/B low flow survey that was conducted on 08-30-2000 and presented in MDNR's revised "Monitoring Report on 26 Waters," indicates the presence of pollutant (e.g., organic pollutants, metals) tolerant bloodworms at the upper most site, and dense epilithic algae at all sites, which is indicative of high nutrients. The presence of dense epilithic algae appears to violate Missouri's general water quality criteria at 10 CSR20-7.031(A). MDNR has identified this waterbody to be partially impaired. EPA proposes to add Long Branch Creek for Unknown pollutants.

(9) Long Branch Creek - Linn County

Downstream 13 mile segment is WBID 602, Class C.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering.

Applicable Standards: Ammonia, DO, General Criteria

Data from the V/B low flow survey conducted by MDNR on 07-17-2000 was used by EPA to derive a Community Tolerance Index (CTI) value. The uppermost stream segment had a CTI of 7.5 and the next downstream site CTI was 6.75, which indicate an impaired biological community. Additionally, pollution tolerant species were reported at the two uppermost stream sites and anoxic sediments were also noted at the uppermost stream site. Given these conditions, it appears that the waterbody is not meeting its designated uses and is not in compliance with water quality standards at 10 CSR20-7.031 (3)(G). EPA proposes to add Long Branch Creek for Unknown Pollutants.

(10) Muddy Creek - Mercer County

WBID 557, Class P.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering

Applicable Standards: Ammonia and DO in limited warm water streams, General Criteria

MDNR conducted a V/B low flow stream survey on 08-03-2000. Data from the Stream Survey form and the "Monitoring Report on 26 Waters" describes the following: Sampling Site 1 included abundant heptageniid mayflies, hydropsychid caddisflies, riffle beetles. There was minor growth of epilithic, prostrate algae; Site 2 included 8 types of invertebrates including abundant heptageniid mayflies, hydropsychid caddisflies, riffle beetles, bryozoans, and minnows. Site 3 yielded 6 types of aquatic invertebrates including abundant heptageniid mayflies and abundant dobsonfly larvae. Minnows, darters, and sunfish were also found. Some of the rocks had been darkened by manganese, indicating periods of low dissolved oxygen in the stream. There was sparse growth of long-stranded, filamentous algae growing on mud. MDNR's Comparative Notes section in the "Monitoring Report on 26 Waters" states that "overall, biodiversity appeared to be reduced." Further, MDNR states that

“Algae were more dominant in this stream than it was in other streams in the area and the water was slightly green, which could indicate increased nutrients. MDNR had judged this stream as partially impaired EPA, therefore, proposes to add Muddy Creek to Missouri’s list for Unknown pollutants.

(11) **Sandy Creek** - Putnam County

WBID 652, Class C.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering

Applicable Standards: Ammonia, DO, sulfate+chloride, pH, General Criteria

As provided in the “Monitoring Report of the 26 Waterbodies”, the V/B low flow survey conducted by MDNR on 07-17-2000 at Hwy YY found eleven types of aquatic invertebrates including heptageniid mayflies and riffle beetles. Creek chubs, shiners, and sunfish were also found. Notwithstanding the 11 types of aquatic invertebrates, it was noted that the specific conductance was quite high when compared to streams in the same region with similar drainage and discharge. Three sites on Sandy Creek were monitored for chemical parameters by MDNR in 2001. No DO measurements were taken. A CTI value of 7.1 was calculated by EPA from the biological data contained in the V/B survey form thereby indicating that Sandy Creek is not meeting Missouri’s water quality standards for aquatic life use protection. EPA proposes to add Sandy Creek for Unknown Pollutants.

(12) **West Fork Locust Creek** - Linn and Sullivan counties

Downstream 17 mile segment is WBID 612, Class P.

Next 17 miles WBID 613, Class C.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering.

Applicable Standards: Ammonia, DO, General Criteria

A low flow survey was conducted by MDNR on 07-17-2000. The Aquatic invertebrate survey at two sites indicated the presence of 13 types of aquatic invertebrates at Site 1 including pollution tolerant Chironomids (blood worms), heptageniid mayflies, glass shrimp, fingernail clams, bullhead catfish, and minnows. Eight types of aquatic invertebrates were noted at Site 2 including Chironomids, along with riffle beetles and ephemerid mayflies. No physical or chemical measurements were made. MDNR has identified this waterbody as partially impaired. EPA proposes to add West Fork Locust Creek for Unknown pollutants.

(13) **Willow Branch (possibly N. Blackbird Creek)** - Putnam County

Unclassified, No WBID.

Applicable Standards: Ammonia, DO, General Criteria

MDNR gave no impairment rating for this stream in the “Monitoring Report on 26 Waterbodies”. A V/B low flow survey was conducted by MDNR on 07-17-2000. In addition to MDNR’s revised “Monitoring Report on 26 Waterbodies,” EPA received a copy of the original survey

form to review. The narrative summary in the monitoring report notes 9 types of aquatic invertebrates including crayfish, dragonflies, and Baetid mayflies. Bluntnose minnows and shiners were also found in the stream. Substrate was predominantly silt and sand and there were no evident aesthetic problems at this site. Based on the biological data contained in MDNR's Visual/Benthic field survey sheet, a CTI of 7.1 was calculated. The CTI value of 7.1 indicates impairment. EPA proposes to add Willow Branch to Missouri's 2002 Section 303(d) list for Unknown pollutants.

2. Waterbodies Not Being Added

EPA is not adding the following waterbodies to Missouri's List:

(1) Blackbird Creek - Putnam County

(Blackbird Creek was evaluated, although not required)

Downstream 10 miles WBID 653, Class P. Forks at this point.

17 miles of North Fork WBID 654, Class C.

13 miles of South Fork WBID 655, Class C.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering for all three classified segments, plus Whole Body Contact Recreation for WBID 653.

A V/B low flow survey was conducted by MDNR on 07-17-2000. The summary discussion contained in MDNR's revised "Monitoring Report on 26 Waters" indicates that macroinvertebrate communities present in the stream indicate healthy stream conditions. For instance, 12 types of aquatic invertebrates were noted at site 1, including heptageniid mayflies, riffle beetles, and fingernail clams. Shiners, creek chubs, and bullhead catfish were also found. There were no evident aesthetic problems at this site; site 2 noted 12 types of aquatic invertebrates, including heptageniid mayflies, riffle beetles, and fingernail clams. Shiners, creek chubs, and bullhead catfish were also found. There was no evident aesthetic problems at this site, although unrestricted cattle access less than 50 meters downstream from this site was contributing to significant bank erosion; At site 3, there were 9 types of aquatic invertebrates noted, including heptageniid mayflies, hydropsychid caddisflies, and fingernail clams. Fathead minnows, creek chubs, and bullhead catfish were also found in the stream. Although the CTI values calculated for the three sampling sites were 6.1, 6.4, and 7.0, the quarterly chemical monitoring data conducted by MDNR from 03-21-2000 to 06-06-2002 did not demonstrate exceedances of water quality standards. Based on EPA's review of the data and/or information contained in the monitoring report, EPA is not adding Blackbird Creek to Missouri's list.

(2) **McCarty Creek** - Vernon County

Downstream 17 mile segment is WBID 1338, Class C.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering

Applicable Standards: Ammonia and DO in limited warm water streams, General Criteria

A V/B low flow survey was conducted by MDNR on 08-07-2000. No survey form was provided to EPA from which to derive CTI values. However, monitoring data collected by MDNR was provided to EPA. Upon review of the summary contained in MDNR's revised "Monitoring Report on 26 Waters," it appears that McCarty Creek is in compliance with Missouri's water quality standards based on the presence of aquatic life that indicate overall good stream health. For instance, 8 types of aquatic invertebrates were noted including heptageniid and Baetid mayflies, hydropsychid caddisflies, and riffle beetles. Minnows, creek chubs, and darters were also found in the stream. Site 2 reported similar results including top minnows and darters. Given the macroinvertebrate species present, it appears that McCarty Creek's biological community is in overall good health. Based on EPA's review of Missouri's monitoring report, EPA is not adding McCarty Creek to Missouri's list.

(3) **Raccoon Creek** - Grundy County: Downstream 4 mile segment is WBID 586, Class C.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering

Applicable Standards: DO, Ammonia, General Criteria

WPCP staff conducted a V/B Low Flow Survey at Hwy 146 in the Spring of 2000. No V/B survey form was provided from which to derive a CTI value. MDNR made the following conclusion regarding their survey, "No problems were noted and the aquatic invertebrate community looked acceptable for a small prairie stream. However, multiple manure spills at the CG-Scott Farm have in the last 2 years caused acute toxicity conditions in a small upstream, unclassified portion of this stream. EPA also has historical records obtained from MDNR covering the period 1/28/95 to 10/31/00 which confirms 15 wastewater discharges from Scott Farm, Scott/Colby Farm 3, Scott/Colby Field 10, Scott/Colby, Scott Farms 3, 4, 6, and 7 for which MDNR initiated enforcement action. Documented fish kills in Raccoon Creek were associated with wastewater discharges that occurred on 7/13/99 and 10/31/00. Scott-Colby Farms NPDES permit (MO-0118133) is a Technology-based no discharge facility (i.e., no discharge of process waste) facility. The permit addresses anaerobic lagoons, storage lagoons, wastewater irrigation, secondary containment, stormwater runoff controls, dead animal transfer station, domestic wastewater septic tanks, land application, and monitoring. Best Management Practices and upstream/downstream monitoring for N, P, pH, T, TSS, THM, and FC are integral parts of the permit for addressing land application of process waste through the "Plant Available Nitrogen" (PAN) procedure. According to 40 CFR 130.7(b)(1), states are not required to list water quality limited segments still requiring TMDLs where effluent limitations required by the CWA, more stringent effluent limitations required by either state or local authority or federal authority, and other pollution

control requirements required by local, state, or federal authority are stringent enough to implement any water quality standards applicable to such waterbodies. EPA is not adding Racoon Creek to Missouri's list.

(4) Shoal Creek - Putnam County

WBID 650, Class C.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering

Applicable Standards: Ammonia, DO, pH, SO₄+Chloride, General Criteria

The data from the V/B low flow stream survey conducted on 07-17-2000, and the narrative summary indicate aquatic life present at all four sampling sites which are indicators of a relatively healthy stream condition. At site 1, four types of aquatic invertebrates were noted, including heptageniid mayflies and hydropsychid caddisflies. Fathead minnows, creek chubs, and golden shiners were also found. Water was slightly turbid; At site 2, nine types of aquatic invertebrates were noted including heptageniid mayflies, hydropsychid caddisflies, and riffle beetles. Golden shiners were also found. Water, again, was slightly turbid; At site 3, nine types of aquatic invertebrates were noted including heptageniid mayflies, hydropsychid caddisflies, and bryozoans. Fingernail clams were abundant. Bullhead catfish, fathead minnows, red shiners, and other shiners were also present. This site had isolated foam, some minor trash, and filamentous algae was present suggesting that nutrients may be entering this stream in its headwaters; At site 4, ten types of aquatic invertebrates were noted including heptageniid mayflies, hydropsychid caddisflies, and bryozoans. Fingernail clams were abundant, and sunfish and shiners were also found. Specific conductance is slightly elevated. Biological data from the V/B survey form was used by EPA to derive Community Tolerance Index (CTI) values of 5.0, 6.1, 5.4, and 6.4 for these four sites, respectively, thereby indicating non-impairment. Quarterly monitoring data from MDNR/ESP Field Services Section which was provided to EPA indicate compliance with Missouri's water quality standards. Based on EPA's review of the data and/or information in Missouri's monitoring report, EPA is not adding Shoal Creek to Missouri's list.

(5) Swan Creek - Taney and Christian Counties

Downstream 29 mile segment is WBID 2490.

Class P. Next 2 miles is WBID 2492, Class C,

Designated Uses for 2490: Protection of Aquatic Life, Livestock and Wildlife Watering,
Cool water fishery, Irrigation, Whole Body Contact
Recreation, Boating

Designated Uses for 2492: Protection of Aquatic Life, Livestock and Wildlife Watering

Applicable Standards: General Criteria

Aquatic macroinvertebrate monitoring by MDNR is scheduled for 2004. In the meantime, chemical monitoring by the USGS every other month between 11/08/99 and 09/12/01 does not indicate any violations of the State's numeric water quality standards. Dissolved oxygen, metals, ammonia, and fecal coliform levels are meeting State numeric water quality standards. MDNR judged

this waterbody to be in full attainment. Based on the data or information contained in Missouri's monitoring report, EPA is not adding Swan Creek to Missouri's list.

(6) Thompson River - Harrison, Grundy and Livingston Counties

WBID 549, Class P.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering, Irrigation, and Drinking Water Supply.

Applicable Standards: Atrazine, ammonia, DO, General Criteria

The MDNR initiated a contract with the USGS in 1999 to monitor the Thompson River at the Hwy 136 crossing at Mt. Moriah, Missouri, six times annually. The USGS chemical monitoring data for the period 11/09/99 and 05/09/02, which was provided to EPA, does not indicate any violations of the State's numeric water quality criteria. Based on EPA's review of Missouri's monitoring report, EPA is not adding the Thompson River to Missouri's list.

(7) West Fork Medicine Creek (AKA Little Medicine Creek) - Mercer and Grundy Counties

WBID 623, Class P.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering

Applicable Standards: Ammonia and DO for limited warm water streams, General Criteria

A V/B low flow survey was conducted by MDNR staff on 07-17-2000 and on 08-03-2000. Site 1 noted 5 types of aquatic invertebrates, including riffle beetles and baetid mayflies. Benthic invertebrate diversity and density was low. Minnows were found. There was no notable algal growth; Site 2 noted 7 types of aquatic invertebrates, including abundant heptageniid mayflies, hydropsychid caddisflies, riffle beetles, and bryozoans. Minnows were also found. Habitat was sparse and there was sparse coverage of prostrate and filamentous algae; Site 3 yielded 9 types of aquatic invertebrates, including fingernail clams and bryozoans. Helisoma were abundant and minnows were also found. The water was turbid but there was no notable algal growth. Biological data from the V/B survey form was used by EPA to derive Community Tolerance Index (CTI) values of 5.3, 5.8, and 6.5. Overall, with 2 out of 3 values at less than 6.5, and with an average CTI of 5.9, non-impairment is indicated. The chemical monitoring data from USGS station (06900100) examined by EPA did not indicate any violations of state numeric water quality standards. Ammonia, pH levels were in compliance, but there was no DO data. Based on EPA's review of Missouri's monitoring report, the diversity of the biological community and the absence of violations of numeric water quality criteria, EPA is not adding West Fork of Medicine Creek to Missouri's list.

(8) West Honey Creek - Mercer County

Downstream 12 mile segment is WBID 556, Class C.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering

Applicable Standards: Ammonia and DO in limited warm water streams, General Criteria

Based on EPA's review of the biological data MDNR provided to EPA and their V/B Stream Survey conducted on 08-04-2000, it appears that West Honey Creek is meeting its aquatic life uses. The biological community present in the stream, which included heptageniid mayflies, hydropsychid caddisflies, and riffle beetles, are indicative of good stream health. Minnows were also found in the stream. Data from the V/B low flow survey form was used by EPA to derive Community Tolerance Index (CTI) values 5.7 and 6.3 at the two survey sites, which is indicative of a non-impairment. There was minor growth of epilithic, filamentous algae, moderate growth of prostrate algae, and the water was clear. Based on EPA's review of the data and/or information in Missouri's monitoring report, EPA is not adding West Honey Creek to Missouri's list.

3. Insufficient Data

Data were not sufficient, pursuant to MDNR's Listing Methodology, for EPA to conclude that the following waterbodies of the 26 waterbodies are or are not meeting water quality standards:

(1) **Beaver Creek** - Taney and Douglas Counties
WBID 2476, Class P.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering, Cool Water Fishery, Irrigation, Whole Body Contact Recreation, Boating.

Applicable Standards: General Criteria

The chemical data, collected by the MDNR in 2002 at two locations along Beaver Creek, and presented in the narrative summary of MDNR's revised "Monitoring Report on 26 Waters," does not indicate any violation of the State's numeric water quality standards. MDNR indicated that the aquatic invertebrate data has not yet been analyzed. Until such analysis is done, EPA is unable to determine the water quality status of this waterbody.

(2) **Bull Creek** - Taney and Christian Counties

Downstream 5 miles segment is WBID 2422, Class P, Cold water Fishery.

The next upstream 17 mile segment is WBID 2423, Class P, Cool water fishery.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering, Irrigation, Boating, Whole Body Contact Recreation

Applicable Standards: General Criteria

Aquatic macroinvertebrate monitoring was conducted by MDNR on Bull Creek using biocriteria sampling protocols in 2001 and 2002. The aquatic invertebrate data has not yet been analyzed and should be analyzed by MDNR to help resolve the question of whether or not this

waterbody is in compliance with water quality standards. No fecal coliform data was provided to determine compliance with the whole body contact designation. The monitoring site locations were poorly selected in relation to potential upstream pollution sources of impairment such as the eight domestic wastewater discharges and Patrick Sand and Gravel Company. MDNR has identified this waterbody as attaining water quality standards; however sufficient information is not available for EPA to determine the water quality status of this waterbody.

(3) **Roark Creek** - Taney and Stone Counties

Downstream 3 miles segment is WBID 2437, Class C.

Next upstream 4 mile segment is WBID 2438, Class C.

Designated Uses for 2437: Protection of Aquatic Life, Livestock and Wildlife Watering, Cold Water Fishery, Whole Body Contact Recreation, Boating.

Designated Uses for 2438: Protection of Aquatic Life, Livestock and Wildlife Watering, Whole Body Contact Recreation, Boating.

Applicable Standards: General Criteria

Roark Creek is scheduled for monitoring in 2003 through 2004. Due to the lack of monitoring data, it is not possible to determine whether or not Roark Creek is meeting water quality standards.

4. Waterbodies Already Addressed

(1) **Sewer Branch** - Pettis County

Downstream most 1 mile is WBID 860, Class C.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering.

Sewer Branch has been addressed in Section II.G. entitled “EPA Considerations of Public Comments”. As indicated in that section, EPA proposes to add Sewer Branch to Missouri’s list.

(2) **Locust Creek** - Chariton to Putnam County

WBID 606, Class P.

Designated Uses: Protection of Aquatic Life, Livestock and Wildlife Watering, Protection of Warm Water Aquatic Life and Human Health-Fish Consumption, Boating, and Drinking Water Supply

Locust Creek was mis-identified as Little Locust Creek in the list of 26 waterbodies (Attachment B Waters). Locust Creek is addressed in Section II.F.2. entitled “Delistings Without Good Cause” and, as indicated, EPA proposes to add Locust Creek back to Missouri’s list.

B. Missouri & Mississippi Rivers

1. 1998 Boundary State Pollutants

In accordance with the consent decree, EPA transmitted to Missouri data and information EPA was able to obtain from Iowa, Nebraska, Kansas, Illinois, Kentucky, Tennessee and Arkansas used to include the Mississippi and Missouri Rivers on their EPA approved State 1998 303(d) Lists. This material is referred to as boundary state impairments. EPA considered the material provided to Missouri to be existing and readily available water quality-related data and information which Missouri was to consider in developing their 2002 303(d) List. EPA further expected Missouri to provide a rationale justifying the omission from their 2002 List of any of these boundary state impairments. As part of EPA's decision regarding Missouri's 2002 303(d) List, the Agency must develop a rationale for either including or not including such boundary state impairments on the Missouri 2002 303(d) List.

Missouri's 2002 303(d) List included a one-page summary regarding the boundary state impairments. However, not only was Missouri's rationale justifying omission of these waterbodies limited, the Missouri and, with exception of 5 miles, the Mississippi Rivers were removed from Missouri's 2002 List without good cause.

EPA reviewed the one page of information provided with Missouri's 2002 List. MDNR mentions contacting the boundary states of Tennessee, Illinois, Nebraska, Kansas and Kentucky and data and/ or information obtained from their web-sites or personal contacts. However, no mention is made of the data and information provided by EPA Region 7 in EPA's April 12, 2001, correspondence.

Missouri's 2002 CWA § 303(d) list does not include any Mississippi or Missouri River pollutants that Iowa, Nebraska, Kansas, Illinois, Kentucky, Tennessee, or Arkansas listed on their respective 1998 CWA § 303(d) lists. Nor did Missouri provide a waterbody specific rationale justifying the omission of each pollutant from the 2002 List. Therefore, EPA reviewed the data and information provided to MDNR and other supporting materials EPA was able to obtain using reasonable good faith efforts resulting in the following:

Missouri:

Missouri has listed the following Mississippi River segment in their 2002 CWA 303(d) list:

<u>WB Name</u>	<u>Size</u>	<u>Pollutant</u>	<u>Source</u>	<u>Downstream</u>	<u>Upstream</u>	<u>County</u>
Mississippi R.	5 miles	Lead, Zinc	Herculaneum	Selma, MO	Herculaneum	Jefferson
	Smelter					

Arkansas:

EPA confirmed in a telephone conversation with Arkansas DEQ, on March 27, 2001 that Arkansas had no segments of the Mississippi River listed as impaired in the 1998 CWA § 303(d) list.

Kansas:

A letter from Kansas Department of Health and Environment to EPA Region 7 dated January 3, 2001 confirmed that Kansas has not monitored the Missouri River since 1990 and no segments of the Missouri River were listed as impaired in the 1998 CWA § 303(d) list.

Kentucky:

A letter from the Kentucky Department of Environmental Protection to EPA Region 7, dated January 4, 2001, confirmed that Kentucky collects no data on the main stem of the Mississippi River and, to the best of their knowledge, the closest USGS water quality station is at Thebes, IL, upstream of the Ohio River confluence. Additionally, no segments of the Mississippi River were listed as impaired on their 1998 CWA § 303(d) list.

Nebraska:

<u>Watershed</u>	<u>HUC</u>	<u>ID</u>	<u>Waterbody</u>	<u>Pollutant</u>	<u>Potential Sources</u>	<u>Size</u>
Lewis & Clark Lake	10170101	NE-MT2-10000-1998	Missouri River	Pathogens	Agriculture	109.2 miles
Keg-Weeping Water	10240001	NE-NE1-10000-1998	Missouri River	Pathogens	Urban runoff /storm sewers, agriculture	101.2 miles

<u>Watershed</u>	<u>HUC</u>	<u>ID</u>	<u>Waterbody</u>	<u>Pollutant</u>	<u>Potential Sources</u>	<u>Size</u>
Blackbird-Soldier	10230001	NE-MT1-10000-1998	Missouri River	Pathogens	Urban runoff /storm sewers, municipal point source, agriculture	139.8 miles

A letter from the Nebraska Department of Environmental Quality dated January 16, 2001 to EPA Region 7 confirmed the listing of the above Missouri River segments in the 1998 CWA § 303(d) list. The Fecal Coliform data collected from the three Missouri River segments that was used to list the Nebraska segments has been analyzed by EPA Region 7.

In NE-NE1-10000-1998, the geometric means for Fecal Coliform bacteria samples exceeded 200 colonies / 100 ml in all three months sampled during the recreational season (July to September 1994). Missouri's water quality standards for Fecal Coliform bacteria of 200 colonies / 100 ml is limited to classified waters designated for whole body contact recreation. The overlapping reach of the Missouri River (MO 0226 1998) with Nebraska is not designated in Missouri for whole body contact recreation; therefore, Missouri's Fecal Coliform water quality standards does not apply to this segment of the Missouri River in Missouri.

Tennessee:

<u>Watershed</u>	<u>HUC</u>	<u>ID</u>	<u>Waterbody</u>	<u>Pollutant</u>	<u>Potential Sources</u>
Lower Mississippi-Memphis	8010100	TN080101000-0102.3-1998	Mississippi River	Dioxin, PCBs, Pesticides*, siltation*	Agriculture, contaminated Sediment, dredging*, source in other state*, urban runoff/storm sewers*

Lower Mississippi-Memphis	8010100	TN080101000-05-1998	Mississippi River	Dioxin, PCBs, pesticides, siltation	Agriculture, contaminated sediment, dredging, source in other state
Lower Mississippi-Memphis	8010100	TN080101000-10-1998	Mississippi River	Dioxin, PCBs, pesticides, siltation	Agriculture, contaminated sediment, dredging, source in other state
Lower Mississippi-Memphis	8010100	TN080101000-18-1998	Mississippi River	Dioxin, PCBs, pesticides, siltation	Agriculture, contaminated sediment, dredging, source in other states
Lower Mississippi-Memphis*	8010100	TN080101000-326.7-1998	Mississippi River	Dioxin, PCBs, pesticides, siltation	Agriculture, contaminated sediment, dredging, source in other states

* These were not identified in EPA's April 12, 2001 correspondence to MDNR

A letter from the Tennessee Department of Environment and Conservation (TDEC) to EPA Region 7, dated January 12, 2001, confirmed the above segments of the Mississippi River were listed by Tennessee in 1998.

The primary source of information Tennessee used to place these waterbodies and pollutants on their 1998 CWA § 303(d) list included three consecutive years (prior to 1998) of fish tissue samples collected at five stations on the Tennessee side of the river from near Tiptonville to near the Mississippi state line, a USGS report about the Mississippi River, ambient monitoring stations maintained by Tennessee and USGS near Memphis with data in STORET, and qualitative information about dredging, levees and other habitat modifications along the river. Additionally, Tennessee considers the existence of a long-standing fish advisory on the Mississippi River near Memphis to represent the loss of the recreational designated use.

According to the TDEC web-site (10/25/00) for "Posted Streams and Lakes in Tennessee," there is a fish tissue advisory for Chlordane and other organics recommending not consuming fish and prohibiting commercial fishing on the Mississippi River from the Mississippi state line to mile 745. The Mississippi River segment designated as TN080101000-18-1998 has comments on the Tennessee 1998 CWA § 303(d) list that fish tissue samples from Tiptonville have indicated elevated contaminant levels. (However, it is unknown which pollutants have elevated levels).

The Missouri designated uses for the Mississippi River from the junction of the Ohio River to the Missouri state line are irrigation, livestock and wildlife watering, protection of warm water aquatic life and human health-fish consumption, boating and canoeing, drinking water supply and industrial. Missouri's numeric water quality standards for this waterbody segment for PCBs is 0.000045 ug/l and Dioxin is 0.03 ug/l (drinking water supply use) and 0.000014 ug/l (human health protection – fish consumption). Missouri also has numeric water quality standards for 21 different pesticides. For siltation impairment, Missouri has a narrative criteria that waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community.

EPA guidance “Use of Fish and Shellfish Advisories and Classifications in 303(d) and 305(b) Listing Decisions” (Oct. 24 2000), recommends that waters with a fish consumption advisory demonstrate non-attainment of water quality standards, i.e., “fishable” when: the advisory is based on fish data, data are collected from the waterbody in question, and the risk assessment parameters of the advisory are cumulatively equal to or less protective than those of the State water quality standards. EPA has reviewed the results of the Tennessee fish tissue study from 1992-1997, including the data from Tiptonville, and found there are no violations of Missouri’s human health advisory limits or Missouri water quality standards where data was collected in the adjoining waterbody segment to Missouri (see reference). The Tennessee fish tissue study included the analysis of various metals, PCBs, Dioxin, Chlordane, Dieldrin, HCB, DDT and Endrin.

In conclusion, for pesticides and siltation, the data reviewed indicates that Missouri water quality standards are being met.

Iowa:

<u>Watershed</u>	<u>ID</u>	<u>Waterbody</u>	<u>Pollutant</u>	<u>Listing Agency</u>
Skunk River Basin	IA 03-SKM-0010-1	Mississippi River	Fecal Coliform Bacteria	IDNR
Skunk River Basin	IA 03-SKM-0010-1	Mississippi River	Ammonia	EPA
Northeast Iowa River Basin	IA 01-NEM-0010-2	Mississippi River	Fecal Coliform Bacteria	EPA
Northeast Iowa River Basin	IA 01-NEM-0010-4	Mississippi River	Organic Enrichment	IDNR
Western Iowa River Basin	IA 06-WEM-0010-0	Missouri River	Unknown and Siltation	EPA
Western Iowa River Basin	IA 06-WEM-0020-1	Missouri River	Unknown and Siltation	EPA
Western Iowa River Basin	IA 06-WEM-0030-0	Missouri River	Unknown and Siltation	EPA
Western Iowa River Basin	IA 06-WEM-0040-0	Missouri River	Unknown and Siltation	EPA

A letter from the Iowa Department of Natural Resources (IDNR) to EPA Region 7, dated January 30, 2001, confirmed the above list of impaired segments. While the data from each of these waterbodies are from above the border of Missouri, they may be relevant in assessing the water quality for Missouri unless this data shows localized effects above the border of Missouri. The designated uses for the reach of the Mississippi River from the junction of the Des Moines River to the Missouri River (MO 0001 1998) include whole-body-contact recreation, livestock and wildlife watering, protection of warm water aquatic life and human health— fish consumption, whole body contact recreation, boating and canoeing, drinking water supply and industrial.

In 1999, EPA Region 7 partially disapproved Iowa's 1998 303(d) list and added, among other waterbodies, the Missouri and Mississippi River waterbody segments and pollutants listed above. EPA added Missouri River segments based on Iowa CWA § 305(b) assessment database comment fields stating the waterbody segments were impaired by siltation and nutrients from agriculture. The Iowa 305(b) assessment database also identified these waterbodies as partially or not supporting their designated uses due to an Unknown or Unidentified pollutant. During EPA's public comment period, EPA was not provided other information indicating these waterbodies were meeting water quality standards. For siltation impairment, Missouri has a narrative criteria that waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community. For siltation, EPA does not have the benefit of data or information to know whether Missouri's water quality standards are being met.

Even though EPA added the Mississippi River segment IA 01-NEM-0010-2, as impaired by the pollutant Fecal Coliform bacteria, to Iowa's 1998 CWA § 303(d) list, EPA is currently unable to locate data supporting this listing either in Iowa's 305(b) assessment database or in EPA records (See EPA, Sept. 23, 1999, Summary of Reasons for Revising EPA's Identification of Waters for Iowa's 1998 § 303(d) List). The explanation for this omission is likely due to EPA Region 7 having accidentally listed FCB (Fecal Coliform bacteria) rather than PCB on the Iowa CWA § 303(d) list.

While PCBs were not listed as a pollutant for the Mississippi River segment IA 01-NEM-0010-2 by either EPA Region 7 nor IDNR, data were found in IDNR's CWA § 305(b) assessment database entries, provided in IDNR's 2001 letter, indicating PCB concentrations in carp and carpsuckers on the Iowa side of Pool 15 that exceed the FDA action level from samples collected in the Fall of 1994. Because of this, fish consumption advisories remain and the assessment of fish consumption uses is non-supporting. July 1996 data indicates PCB levels up to 7.4 mg/kg in subsurface sediments in a relatively narrow band along the Iowa shore adjacent to the ALCOA facility. This data shows localized effects above the border of Missouri.

IDNR also listed the Mississippi River segment IA 01-NEM-0010-4, which stretches from the Iowa River to Lock & Dam 13 at Clinton, Iowa, for Organic Enrichment. As defined in the CWA § 305(b) assessment database report in IDNR's letter to EPA Region 7, this listing was based upon a study by ADM Corn Processing, Clinton, in Beaver Slough during summer and fall 1996 in response to complaints of slime growth. Conclusions of the study included that ADM wastes appear to accentuate the growth of the slime organism, that slime growth is enhanced by small quantities of organic matter, primarily corn starch, in low flow quiet areas before being mixed with the flow of the main river, and that

the slime growth was not enhanced when organic matter is allowed to mix in the main river. The listing was based upon the occurrence of slime growth in Beaver Slough, and potentially in areas downstream of Beaver Slough. While the Missouri narrative water quality standards would apply for organic enrichment, this data shows localized effects above the border of Missouri.

The Mississippi River segment IA 03-SKM-0010-1, which stretches from the Iowa/ Missouri state line to the outfall of Ft. Madison WWTP, for Ammonia was listed by EPA Region 7 based on information in the Iowa CWA § 305(b) assessment database that this waterbody segment is impaired by Ammonia and was only partially meeting its designated beneficial uses. During EPA's public comment period, EPA was not provided other information indicating these waterbodies were meeting water quality standards. IDNR clarified in the January 30, 2001, letter that the CWA § 305(b) assessment database statements were based on historical monitoring data from the Illinois EPA monitoring station at Keokuk (K 04) and three additional references (see IDNR, January 30, 2001 letter).

IDNR listed the same segment, IA 03-SKM-0010-1, as impaired for Fecal Coliform bacteria based upon the IL EPA station K04 data. IDNR's 305(b) assessment database details that for Fecal Coliform bacteria samples collected in the summers of 1996-1997 the geometric mean of the 5 non-flow affected samples was 144 organisms / 100 ml, although more than 10% of the samples exceeded 400 organisms / 100 ml. Additional information from IDNR to EPA on November 6, 2002, provided additional Fecal Coliform bacteria data collected in the summers of 1998-2000 indicating nine non-runoff-affected samples with a geometric mean of 139 organisms/ 100 ml and one of the nine samples (11%) exceeded the EPA-recommended single-sample maximum value of 400 organisms / 100 ml. For the 1998 - 2000 data, the mean of the non-flow affected samples is 787 Fecal Coliform colonies / 100 ml and the standard error is 677 colonies / 100 ml which was influenced by a single value of 6200 Fecal Coliform colonies / 100 ml taken on August 31, 1998.

IDNR verified that these samples were taken at the IL EPA station K 04 at the east edge of Keokuk, IA, immediately downstream from Lock and Dam 19 at river mile 364. This monitoring station is located within 3 miles of Missouri's state border and within Pool 20 which extends to Canton, Missouri. Based upon the proximity of the monitoring station to Missouri's border and being located in Pool 20, the Ammonia and Fecal Coliform bacteria data collected from this station and used to list the Iowa segments has been analyzed by EPA Region 7.

Missouri has numeric criteria for Ammonia based upon temperature and pH for warm-water fisheries. None of the Ammonia values from the Keokuk data exceeded Missouri's water quality standards for Ammonia.

Missouri's water quality standard for Fecal Coliform bacteria of 200 colonies / 100 ml is limited to classified waters designated for whole-body-contact recreation. The downstream reach of the Mississippi River (MO 0001 1998 – Des Moines River to Missouri River) with Iowa is designated in Missouri for whole-body-contact recreation; therefore, Missouri's Fecal Coliform water quality standards applies to this segment of the Mississippi River in Missouri.

In applying Missouri's 2002 303(d) Listing Methodology, the 14 "non-flow/non-runoff affected" samples collected by Iowa in the summers of 1996-2000 would be considered too small of a dataset to be used for listing purposes. According to Missouri's 2002 303(d) Listing Methodology, "small

amounts of chemical data” (i.e., less than 20 samples) is considered Level One data which, as stated earlier, is generally not used for listing waterbodies as impaired unless sample variances are low enough to offset sample size. However, the high variability of this data set does not offset the small sample size. In conclusion, based on the small size and high variability of the data set, fecal coliform impairment of the downstream reach of the Mississippi River is inconclusive. Therefore, fecal coliform is not being added as a boundary state pollutant. EPA recommends that additional monitoring for Fecal Coliform bacteria be conducted on the Upper Mississippi River in Missouri in an effort to raise the data quality up to Level Two or better which, in turn, can be assessed during the next listing cycle.

Illinois:

<u>Watershed</u>	<u>ID</u>	<u>Waterbody</u>	<u>Pollutant</u>	<u>Potential Sources</u>
ILJ81	TJ 17	Mississippi River	03M, 05M, 09M, 11M, 16M, 21M	01M, 02H, 04M, 10M, 11M, 40S, 70M
ILJ81	J 01	Mississippi River	05S, 03M, 05M, 09M, 11M, 16M	01M, 02H, 04M, 10M, 11M, 40S, 70M
ILJ81	TJ 12	Mississippi River	03M, 05S, 09S, 11M, 16M, 21M	01S, 02S, 10M, 11M, 40S, 70M
ILJ81	J 81	Mississippi River	03M, 05M, 09M, 11M, 16M, 21M	01M, 02H, 04M, 10M, 11M, 40S, 70M
ILJ81	J 82	Mississippi River	03M, 05M, 09S, 11M, 16M, 21M	01S, 02S, 10M, 11M, 70M
ILJ83	TJ 04	Mississippi River	03M, 09S, 11M, 16M, 21M	02S, 10M, 11M, 70M
<u>Watershed</u>	<u>ID</u>	<u>Waterbody</u>	<u>Pollutant</u>	<u>Potential Sources</u>
ILJ83	J 83	Mississippi River	03M, 09S, 11M, 16M, 21M	02S, 10M, 11M, 70M
ILJ83	TJ 15	Mississippi River	09S, 11S, 15S, 16S	10S, 70S
ILJ83	TJ 16	Mississippi River	09S, 11S, 15S, 16S	10S, 70S
ILJ83	TJ 13	Mississippi River	03M, 05S, 09S, 11M, 16M, 21M	01S, 02S, 10M, 11M, 40S, 70M
ILI83	TJ 14	Mississippi River	09S, 11S, 15S, 16S	10S, 70S
ILKO2	TK 12	Mississippi River	09S, 11S, 16S	02S, 10S, 70S
ILI84	TI 01	Mississippi River	09S, 11M, 16M, 03H, 05M	01M, 02M, 10M, 11M, 40S, 70M

ILI84	TI 04	Mississippi River	09S, 11M, 16M, 03H, 05M	01M, 02M, 10M, 11M, 40S, 70M
ILI84	TI 03	Mississippi River	09S, 11M, 16M, 03H, 05M	01M, 02M, 10M, 11M, 40S, 70M
ILI84	I 81	Mississippi River	09S, 11M, 16M, 03H, 05M	01M, 02M, 10M, 11M, 40S, 70M
ILI84	I 84	Mississippi River	09S, 11M, 16M, 03H, 05M	01M, 02M, 10M, 11M, 40S, 70M
ILJ03	TJ 06	Mississippi River	03M, 05M, 09S, 11M, 16M, 21M	01M, 02H, 04M, 10M, 11M, 40S, 70M
ILJ03	J 03	Mississippi River	03M, 05M, 09S, 11M, 16M, 21M	01M, 02H, 04M, 10M, 11M, 40S, 70M
ILJ03	J 96	Mississippi River	03M, 05M, 09S, 11M, 16M, 21M	01M, 02M, 04S, 10M, 11M, 40S, 70M
ILJ03	TJ 05	Mississippi River	03M, 05M, 09S, 11M, 16M, 21M	01M, 02M, 04S, 10M, 11M, 40S, 70M
ILI01	TI 08	Mississippi River	09S, 11M, 16M, 03H, 05M	01M, 02M, 04S, 10M, 11M, 40S, 70M
ILI01	I 01	Mississippi River	09S, 11M, 16M, 03H, 05M	01M, 02M, 04S, 10M, 11M, 40S, 70M
ILI01	I 98	Mississippi River	09S, 11M, 16M, 03H, 05M	01M, 02M, 04S, 10M, 11M, 40S, 70M
ILI01	TI 06	Mississippi River	09S, 11M, 16M, 03H, 05M	01M, 02M, 04S, 10M, 11M, 40S, 70M

<u>Watershed</u>	<u>ID</u>	<u>Waterbody</u>	<u>Pollutant</u>	<u>Potential Sources</u>
ILI01	TI 05	Mississippi River	09S, 11M, 16M, 03H, 05M	01M, 02M, 04S, 10M, 11M, 40S, 70M
ILI02	I 02	Mississippi River	09S, 11M, 16M, 03H, 05M	01M, 02M, 10M, 11M, 40S, 70M
ILK07	K 05	Mississippi River	03S, 09S, 11S, 16S	10S, 70S
ILK07	TK 06	Mississippi River	03S, 09S, 11S, 16S	10S, 70S

ILK07	TK 04	Mississippi River	03S, 09S, 11S, 16S	10S, 70S
ILK07	K 14	Mississippi River	03S, 09S, 11S, 16S	10S, 70S
ILK01	TK 07	Mississippi River	03S, 09S, 11S, 16S	10S, 70S
ILK01	K 09	Mississippi River	09S, 11S, 16S	10S, 70S
ILK01	K 98	Mississippi River	09S, 11S, 16S	10S, 70S
ILK06	TK 01	Mississippi River	03S, 09S, 11S, 16S	10S, 70S
ILK06	TK 02	Mississippi River	03S, 09S, 11S, 16S	10S, 70S
ILK06	K 02	Mississippi River	03S, 09S, 11S, 16S	10S, 70S
ILK02	TK 12	Mississippi River	09S, 11S, 16S	02S, 10S, 70S
ILI84	I 84	Mississippi River	09S, 11M, 16M, 03H, 05M	01M, 02M, 10M, 11M, 40S, 70M
ILI02	I 02	Mississippi River	09S, 11M, 16M, 03H, 05M	01M, 02M, 10M, 11M, 40S, 70M

A letter from Illinois EPA to EPA Region 7 dated January 31, 2001 confirmed the above segments were listed by Illinois in their 1998 CWA § 303(d) list. **(Appendix A has been attached which includes the definitions for the abbreviations from the Illinois 1998 CWA § 303(d) List.)** As a quick reference, the pollutants listed above include: Pollutant 03 - priority organics, Pollutant 05 - metals, Pollutant 09 - nutrients, Pollutant 11 - siltation, Pollutant 15 - flow alteration, Pollutant 16 - other habitat alterations, Pollutant 21 - suspended solids.

The “Illinois Water Quality Report, Volume II, 1994-1995” dated August 1996, shows in Appendix E “Ambient Water Quality Monitoring Network (AWQMN)” three monitoring stations on the Mississippi River and Appendix H “Fish Contaminant Monitoring Stations” shows ten permanent sampling locations on the Mississippi River for whole fish and fillet, or just fillet, sampled in even years.

Illinois indicated that it assumed that the aquatic life use equals the overall use. In the 1980s, Illinois used a water quality index and a macroinvertebrate index to rate the Mississippi River. At that time, Illinois had four stations along the river, but Illinois hasn’t done any macroinvertebrate monitoring on large rivers, i.e., Illinois and Mississippi, since 1990. Since that time, Illinois has used the percentage of water quality violations at ambient stations to determine impairment of aquatic life, i.e., greater than 10% violation of any standards results in less than full support. Illinois staff noted that the fish consumption advisory was a factor in listing the Mississippi River as impaired during the 1994-95 cycle.

In conclusion, while the information provided to EPA by the Illinois EPA is useful in describing Illinois’ Water Quality program and 1998 Section 303(d) list approach, there is no data from Illinois that indicates non-compliance with Missouri Water Quality Standards. Therefore, no boundary pollutants

identified by Illinois in its 1998 Section 303(d) are being added to Missouri's 2002 list for the Mississippi River.

2. Other Mississippi & Missouri Rivers Data

After considering the boundary state impairment data and information, EPA conducted a thorough STORET data retrieval for contaminants in the Missouri and Mississippi Rivers. Contaminants identified in the STORET data retrieval were compared to State of Missouri water quality criteria found in Rules of Department of Natural Resources. Division 20-Clean Water Commission Chapter 7-Water Quality (Code of State Regulations, 1996) and Missouri Department of Health and Senior Services (MDHSS) 'screening values' for fish tissue. Two parameters in fish tissue samples were found to be of concern in both the Missouri and Mississippi Rivers: Chlordane (technical mixture and metabolites) and Mercury. Moreover, the MDHSS has an advisory in effect for Missouri and Mississippi Rivers warning the public not to eat Sturgeon and Sturgeon eggs because Chlordane and PCBs have been found at levels of health concern. As such, Missouri's Aquatic Life Use Designation of the Missouri and Mississippi Rivers for the protection of Warm Water Aquatic Life and Human Health - Fish Consumption, as provided in Missouri WQS 10 CSR 7.03, is not supported. This, in turn, constitutes an impairment. Fish tissue data provided to EPA by the Missouri Department of Conservation (MDC) corroborates this conclusion. Out of a total of 27 Sturgeon samples (filets and egg) collected during the period of record (1994-Present), 15 samples exceeded the technical Chlordane human health limit of 300 ppb (Technical Chlordane represents all 11 isomers of Chlordane). Eight (8) of these were egg samples which ranged in value from 320 ppb to 2450 ppb and the remaining seven (7) were filet samples that ranged from 301 ppb to 389 ppb. The data provided by MDC also indicated two samples comprised of Sturgeon eggs with PCB concentrations of 4520 ppb and 5810 ppb, respectively. MDHSS's recommended screening value for PCBs found in fish tissue is 2000 ppb.

According to Missouri's 2002 listing methodology, and similarly addressed in EPA guidance, existing and readily available information that is used to assess water quality conditions and to aid in the compilation of the 305(b) report and the Section 303(d) list includes, among many other cited sources of information and/or data, Fish Consumption Advisories as well as violations of State Water Quality Standards. Accordingly, based principally on Missouri's Fish Consumption Advisory for Sturgeon and Sturgeon eggs and corresponding data for the Mississippi and Missouri Rivers compiled by the MDC, EPA proposes to add the following waterbodies and pollutants to the Missouri 303(d) list:

<u>Waterbody Name</u>	<u>Pollutant</u>
Mississippi River ³ :	
Missouri State Line to the Ohio River (WBID 3152)	Chlordane, PCBs
Ohio River to Missouri River (WBID 1707)	Chlordane, PCBs

³ See Table 3 of Enclosure 2 "Pollutants EPA proposes to add back to Missouri's 2002 Section 303(d) list

Missouri River to the Des Moines River(WBID 1)	Chlordane, PCBs
Missouri River ⁴ :	
Mouth to Gasconade River (WBID 1604)	Chlordane, PCBs
Gasconade River to Chariton River (WBID 701)	Chlordane, PCBs
Chariton River to the Kansas River (WBID 356)	Chlordane, PCBs
Kansas River to the Iowa state line (WBID 226)	Chlordane, PCBs

Mercury - Mercury was found in fish tissue samples collected by EPA between 1992 and 2003 above the Missouri Department of Health and Senior Services and EPA's recommended criterion limit of 300 ppb (300 ug/kg). EPA proposes to add the following segments of the Missouri River to the Missouri 303(d) list for Mercury:

<u>Waterbody Name</u>	<u>Pollutant</u>
Missouri River ⁵ :	
Chariton to Kansas City segment at 345 ppb (WBID 356)	Mercury
Kansas River to State Line segment at 312 ppb. (WBID 226)	Mercury

⁴ See Table 1 of Enclosure 2 "Waterbodies EPA proposes to add back to Missouri's 2002 Section 303(d) list

⁵ See Table 1 of Enclosure 2 "Waterbodies EPA proposes to add back to Missouri's 2002 Section 303(d) list

**Appendix A. to Enclosure 1 - Definitions of Abbreviations
Illinois 1998 CWA 303(d) List**

1. **Watershed Identifier** - State waterbody identification number used in the Waterbody System (WBS).
2. **Waterbody Segment** - Alpha numeric identification code for assessment location.
3. **Water Body Name** - Name of stream, river, lake, reservoir, etc.
4. **Size** - Numerical size of the waterbody type as follows:
 - For River or Stream, size - river miles
 - For Great Lake, size- shore miles
 - For Inland Lake, size - acres
 - For Wetland, size - acres
5. **Date** - Date of collection of monitoring data used in assessment.
6. **AL** - (Assessment Level) “total” water assessed are divided into two categories, each category is subdivided into numeric codes indicating how the assessments were made.

M = “monitored waters” are those waterbodies for which the assessment is based on current site-specific ambient and/or intensive data (i.e., data no more than five years old).

19	=	Data extrapolated from upstream or downstream
23	=	Fixed station chemical/physical monitoring, conventionals plus toxics
31	=	Ecological/Habitat surveys
71 or 710	=	Combined sampling of water, sediment or biota for chemical analysis
205	=	Ambient Lake Monitoring Program Chem/Phys data less than 5 years old
206	=	Lake Water Quality Assessment Chemical/Physical data less than 5 years old
710	=	Clean Lakes Program Integrated Intensive data less than 5 years old
869	=	Chemical/Physical data collected by others less than 5 years old

E = “elevated waters” are those waterbodies for which assessment is based on

information other than current site-specific ambient or intensive data.

13	=	Land use information and location of sources
15	=	Monitoring data that is more than 5 years old
17 or 710	=	Professional judgment
19	=	Data extrapolated from upstream or downstream
81	=	Volunteer stream data
811	=	Volunteer Lake Monitoring Program (Citizen) data greater than 5 years old
812	=	Volunteer Lake Monitoring Program-Water Quality (Citizen) data greater than 5 years old
813	=	Volunteer Lake Monitoring Program (Citizen) data less than 5 years old
814	=	Volunteer Lake Monitoring Program-Water Quality (Citizen) data less than 5 years old
150	=	Clean Lakes Program Integrated Intensive data greater than 5 years old
155	=	Ambient Lakes Monitoring Program Chemical/Physical data greater than 5 years old
156	=	Lake Water Quality Assessment Chemical/Physical data greater than 5 years old
170	=	Best Professional Judgment
868	=	Chemical/Physical data collected by others greater than 5 years old

7. Designated Use - Designated uses are identified by the following numeric codes. Each column represents one use type.

01 = Overall Use	05 = Swimming
02 = Fish Consumption	06 = Secondary Contact
04 = Aquatic Life	07 = Public Water Supply
11 = Recreation	

A blank space indicates that the use does not apply to a waterbody.

Use support is identified by a letter code attached to the corresponding designated use code.

F = Full	D = Partial Support/Moderate Impairment
T = Threatened	N = Nonsupport

R = Partial Support/Minor Impairment Blank =Not Assessed

The presence of a designated use code (e.g., 05) and the absence of a support code (e.g. F) indicates that the use exist but no data was available to assess it.

8. Causes - indicates causes of impaired uses from the codes below. Also indicated is the magnitude to which the cause contributes to the use impairment. (H = high; M=moderate, S=slight).

0 =	cause unknown	9 =	nutrients	18 =	radiation
1 =	unknown toxicity	10 =	pH	19 =	oil and grease
2 =	pesticides	11 =	siltation	20 =	taste and odor
3 =	priority organics	12 =	organic enrichment/DO	21 =	suspended solids
4 =	nonpriority organics	13 =	salinity/TDS/Chlorides	22 =	noxious aquatic plants
5 =	metals	14 =	thermal modification	23 =	filling and draining
6 =	ammonia	15 =	flow alteration	24 =	total toxics
7 =	chlorine	16 =	other habitat alterations	25 =	turbidity
8 =	other inorganics	17 =	pathogens	26 =	exotic species

9. Sources - indicates the sources that contribute to the causes listed above. Also, indicated is the magnitude to which the source contributes to the use impairment (H = high, M = moderate, S = slight).

0 Point Sources

01 =	Industrial Point Sources	76 =	Removal of riparian vegetation
02 =	Municipal Point Sources	77 =	Streambank modification/ de-stabilization
04 =	Combined sewer overflows	78 =	Draining/filling of wetlands

09 Domestic Wastewater Lagoon

10 Agriculture

11 =	Nonirrigated crop production
12 =	Irrigated crop production
13 =	Specialty crop production (e.g., truck farming & orchards)
14 =	Pasture land
15 =	Range land

80 Other

81 =	Atmospheric deposition
82 =	Waste storage/storage tank
83 =	Highway maintenance & runoff
84 =	Spills
85 =	In-place contaminants

- 16 = Feedlots - all types
- 17 = Aquaculture
- 18 = Animal holding/management areas
- 19 = Manure lagoons
- 20 Silviculture
 - 21 = Harvesting, reforestation
 - 22 = Forest management
 - 23 = Road construction
- 30 Construction
 - 31 = Highway/road/bridge
 - 32 = Land development
- 40 Urban Runoff/Storm Sewers
- 50 Resource Extraction/Exploration/Development
 - 51 = Surface mining
 - 52 = Subsurface mining
 - 53 = Placer mining
 - 54 = Dredge mining
 - 55 = Petroleum activities
 - 56 = Mill tailings
 - 57 = Mine tailings
 - 58 = Acid mine drainage
- 60 Land Disposal (Runoff/Leachate from Permitted Areas)
 - 61 = Sludge
 - 62 = Wastewater
 - 63 = Landfills
 - 64 = Industrial and land treatment
 - 65 = On-site wastewater systems (septic tanks, etc).
 - 66 = Hazardous waste
 - 67 = Septage disposal
- 70 Hydrologic/Habitat Modification
 - 86 = Natural
 - 87 = Recreational activities
 - 88 = Upstream impoundment
 - 89 = Salt storage sites
 - 891 = Groundwater loadings
 - 892 = Groundwater withdrawal
 - 893 = Waterfowl
 - 894 = Lake fertilization
 - 895 = Herbicide/Algicide application
 - 896 = Forest/grassland/parkland

- 71 = Channelization**
- 72 = Dredging**
- 73 = Dam construction**
- 74 = Flow regulation/modification**
- 75 = Bridge construction**